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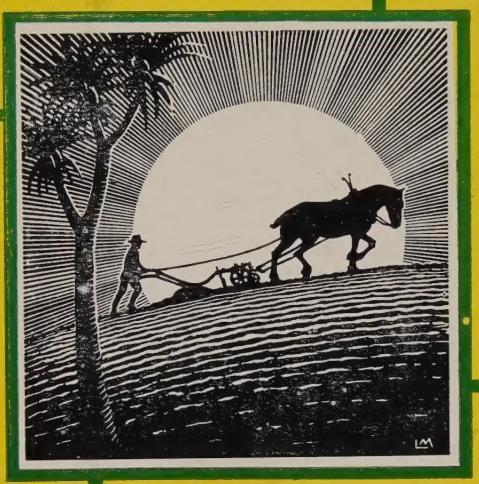

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The New Zealand Journal of Agriculture

Published by direction of the Hon. W. LEE MARTIN, Minister of Agriculture.

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Contagious Abortion of Cattle.

Treatment of Infected Animals and Precautions To Be Taken Against The Disease.

D. MARSHALL, District Superintendent, Live-stock Division, Wellington.

CONTAGIOUS abortion is one of the oldest known diseases of cattle.

In spite of the enormous amount of research work carried out on this disease it remains one of the major plagues of the dairy herd. This is because of the failure to discover an effective treatment and the difficulty of carrying out the control measures which alone will ensure prevention. Few other diseases have been so exploited by vendors of patent medicine. Remedies such as bran and burnt sugar, suitably packeted and labelled, have been widely sold and even freely extolled by their users, who credited such remedies with the bringing about of a period of little or no slipping, which is actually part of the usual cycle of this disease.

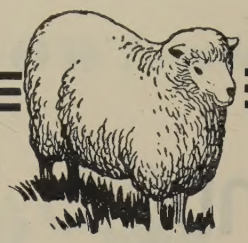
Abortion in the cow may be defined as the birth of the calf before due time. Distinctions between abortion and premature birth are unnecessary. Abortion may be due to severe illness or bloat, and occasionally to deficiency of certain essentials in the food. Certain drugs and plants, such as ergot and penny royal, have been credited with producing abortion.

> The treatment of contagious abortion and precautions which may be taken to prevent the disease are clearly described in this article. In particular, owners are advised to isolate and treat infested and aborting animals to prevent spread and secondary infection, and also to isolate purchased cows from the herd until they have calved safely.

The action of ergot is extremely uncertain when tested experimentally, and there is no reliable evidence suggesting that penny royal may be culpable. In New Zealand probably 90 per cent. of abortions are of the contagious type, due to a specific infection by the contagious abortion germ, or Bang's bacillus, more properly termed recently *Brucella abortus*, bovine variety.

Bang, the Danish veterinarian, discovered this organism in 1896, although the contagious nature of the disease had long been known. It has been suggested that infection by this germ should be termed Bang's disease rather than contagious abortion, as abortion is only a temporary symptom, and one which is not always shown. Many infected cows develop an apparent immunity after one abortion, breed regularly, and calve at due time while still harbouring the organism and distributing it at each parturition. Other cows similarly infected may never actually abort.

The germ is not a highly resistant one, and if exposed in the open to sunlight



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and complete drying it soon dies. Protected from light and desiccation, however, it may remain infective for some months.

Path of Infection.

The great majority of infections occur by way of the alimentary canal—that is, through eating contaminated foodstuffs, pasture being naturally the food most often so infected. Spread by the bull is of comparatively minor importance.

Experimentally, infection can be caused by application of the organisms to any mucous surface, such as the lining of the eyelids or to scarified skin.

When the organisms are swallowed, as in grazing, the infection may localize at first in the lymphatic glands related to the alimentary canal. In the pregnant animal it is carried comparatively soon to the uterus. In the non-pregnant but lactating animal it locates in the udder. Similarly, after abortion the infection will remain in the udder.

The fœtus may be carried to full time, but there is some damage to the placenta, often evidenced by retention of afterbirth. At the time of abortion or parturition the infected cow is most highly infective, as at that time large numbers of organisms are distributed in the placenta, the uterine fluids and discharges, and frequently in the stomach of the calf.

Infection persists in the *udder*, and this organ acts as a reservoir from which infection of the uterus may again occur. It is less important as a source of spread to other animals, but calves fed on infected milk, while themselves unaffected, may serve to distribute the organism. Authorities are somewhat divided as to whether *Brucella abortus* can produce mastitis. The general opinion is that it does not, but that the resistance of the organ to the usual streptococcal and staphylococcal infections is lowered.

In the uterus the organism multiplies between the inner lining and the placenta the latter being affected particularly at its point of attachment to the cotyledons. There is partial death of the membrane, some inflammatory reaction, and the presence of a greyish-yellow, slimy exudate.

The persistence of the organism in the system is :—

(1) In the uterus after abortion or parturition, not more than three to six weeks.

(2) In the udder during that lactation period.

(3) In non-pregnant non-lactating animals probably eliminated within two to three months.

After-effects on Conception.

Retention of the afterbirth is a very common sequel to abortion. The uterus then remains open for an unduly long period, and is exposed to the entry of other secondary infections. These may cause damage to the cervix, to the uterine lining, or to the Fallopian tubes and ovaries.

One frequently meets cases of incurable sterility resulting from irreparable injury to the cervix or to the uterine lining, the latter often with accumulation of purulent fluid, and apparently directly due to a previous abortion. This would seem to occur more often in heifers. The lesions in such cases are, of course, very apparent on examination.

It is not clear to what extent conception is affected in animals harbouring the *Brucella* infection but showing apparently normal reproductive organs. Most investigators state that there is less sterility in clean herds than in abortion-infected herds.

Progress of an Outbreak.

The first evidence of the presence of the disease will be the occurrence of an abortion. Others may follow quickly should other pregnant cows have been infected at the same time as the first. Should this animal remain the only one infected until the time when abortion occurs, others will then become infected, but the disease may not progress sufficiently to cause abortion before parturition at due date occurs.

Abortions may occur the following season, particularly in heifers. Immunity develops in time, usually after first abortion, but odd animals may slip two or three times. Where the infection gains entrance near the end of pregnancy, immunity may be sufficiently developed for succeeding parturitions to occur at due date, many such animals never aborting.

Eventually the majority of the herd has developed an apparent immunity, and for several seasons slipping may be confined

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to heifers. Such immunity may break down at times where new strains of the organism are introduced with purchased animals.

Symptoms in the Animal.

There may be no symptoms, but, should abortion be impending, the signs are similar to those of approaching parturition. They may escape notice in heifers. The first sign may be that the animal has an empty look, or strings of placental membranes may be evident. Cows in milk may show an alteration in the milk, which takes on the appearance of colostrum for a day or two.

According to observations made by Craig, abortions occur at any stage from two months to eight and a half months, the majority being at seven, six, and five months. It should be noticed that in trichomoniasis—an infectious disease of the reproductive organs with which a few herds have been found affected in New Zealand—abortion at two months may occur. There are usually distinguishing features, such as a chronic intermittent discharge, and failure of certain animals to show heat periods.

Infection in the Male.

As stated, the bull is of minor importance in the spread of infection. He may act in this way, however, if allowed to serve a clean animal too soon after being used on a recently-calved or aborted-infected cow. Further, he may contract an active infection of the reproductive organs, sometimes indicated by the swelling of one testicle due to abscess formation in it. It is very unwise to use such an animal for breeding, as, during the acute stage, infection may be distributed with each service.

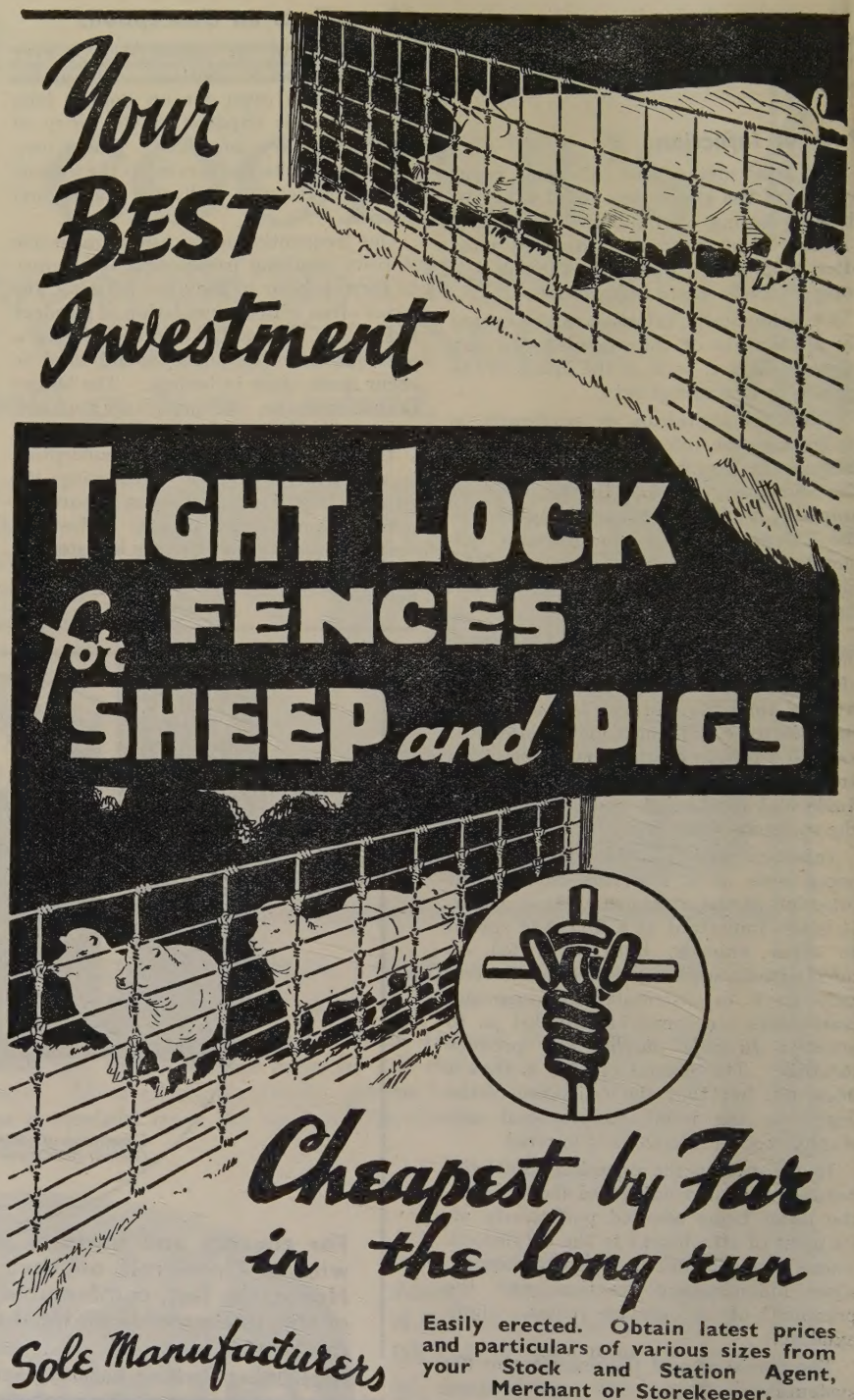
Diagnosis.

For the detection of the presence of *Brucella abortus* infection in an animal the agglutination test may be used. It is based on the presence of certain antibodies in the blood. A small sample of ¼ oz. of blood, usually collected from the tail, is employed, and the test can be carried out at the Department's Animal Research Station at Wallaceville.

It is unreliable if made immediately before an impending abortion or within three or four weeks after. Animals may be infected for three or four weeks before the blood will give the reaction. With these exceptions, the test is recognized as very reliable, and use is made of the test in control measures.

Control Measures Tried.

The use of the agglutination test to detect infected animals and either strict isolation of these animals from the healthy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or elimination by slaughter or sale is one method of control. In the United States of America an extensive campaign on these lines, supported by public funds, is in progress. In New Zealand such a method would meet greater difficulties.

The all-the-year-round-pasture grazing provides much greater exposure to infection in New Zealand. With no isolation at parturition such as occurs under housing conditions the distribution of the organisms is greatly assisted. Several such attempts have broken down after the herd had been free for a period, and the failures were probably due to—

(1) Too long intervals between tests.
(2) Insufficient protection against infection off neighbouring farms. (A certain amount of natural isolation by situation seems necessary.)
(3) Insufficient precautions with purchased stock. (These should not only be negative to the test when brought on to a farm, but should be isolated until they have passed at least one later negative test.)

The above method offers the only means of eliminating the disease. Once established, a clean herd would require constant vigilance in order to prevent the introduction of infection from outside.

Vaccination.

Much work has been done with vaccines, the results of which may be summarized.

Killed vaccines are harmless, but have apparently no value in increasing immunity to the disease.

Full-strength, live vaccines used on non-pregnant animals may show some benefit. They have been blamed for producing sterility in certain cases, and an objection to their use is that infection may be set up in clean animals. Attenuated vaccines offer the greatest hope; they are apparently safe, and yet confer some protection. Their use has not developed beyond the experimental stage.

Chemical Treatment.

The nature of the disease, characterized as it is by alternate waves of abortions followed by quiet periods suggesting disappearance of the infection, has made it the subject of all manner of empirical and quack treatments.

This Department has in the past advocated the use of perchloride of mercury douches to all the herd, with, it was believed, beneficial results. It has now to be stated that up to the present no satisfactory chemical treatment exists, and that apparently good results following such are part of the natural course of the disease.

Liming, improved mineral supplies, and better feeding during pregnancy have been believed to reduce the amount of abortion. While they are excellent measures for improving the general health of the herd, experimental tests give no indication that they influence contagious abortion.

As elimination of the disease from the average dairy herd is at present impracticable and preventive treatment is unreliable, what steps can be taken to minimize the loss?

The presence of *Brucella abortus* (contagious abortion) infection in the majority of New Zealand dairy herds must be

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accepted. Many of the cows in these herds have already acquired an immunity, either as the result of an abortion or through repeated exposure to small degrees of infection.

The occurrence of actual abortion, the most serious cause of loss, seems to depend largely on the size of dosage of the infective germs and partly on the stage of pregnancy at which exposure to this "dosage" takes place. A heavy infection received by a clean animal early in pregnancy will usually result in abortion within two to three months. Such infection is likely to occur through the slipping or calving of an infected cow on the same pasture, as it is at this parturient period that the infected cow freely distributes the organisms.

Use of Maternity Paddock.

Exposure to heavy dosage could therefore be reduced greatly if it could be arranged for all cows to calve in a separate paddock, apart from those not due for two to three months, and for a close watch to be kept on all pregnant animals so that, if possible, any in which abortion was impending could similarly be removed to such a paddock.

Should abortion unfortunately occur, such steps as are possible should still be taken to lessen contamination of pastures by removing the animal to the isolation paddock and burying the fœtus, cleanings, &c.

Do not admit to service any aborting animal for at least two months after all discharges have ceased. The same rule should apply to late-calving cows. Do not use for service a bull about which there is any suspicion of abortion infection.

As far as possible, avoid bringing into the herd pregnant animals from outside sources. Where this must be done, keep them under observation to detect any impending abortion. The blood test might be used to indicate which cows should be watched.

Further Treatment.

Douching of the vagina of aborting animals with a warm, weak (pale pink) solution of Condy's crystals plus a tablespoonful of salt per gallon should be carried out once daily for several days, when the interval may be made longer, until discharges cease. The tail and hind parts of cow should first be washed down, and the operation carried out as cleanly as possible.

Where the afterbirth is retained beyond three days, manual removal may be attempted. This operation requires experience and gentleness and due regard to cleanliness. It should not be persisted in if the membrane is too extensively or too firmly attached or undue straining is caused. Certain precautions on the part of the operator are necessary, such as having the hands and arms clean and well oiled before beginning and thoroughly washed with soap and warm water after finishing. Man may contract a *brucella* infection, with recurrent fever, during such operations on infected animals.

The ultimate disposal of aborting animals will depend on several things. In heifers, where the slip occurs early with little udder-development, the animal is probably better culled, but she may be retained should she be of considerable potential value and the owner in a position to carry her over for another season and run the risk of her proving sterile, which is not great.

Where the slip occurs well on, an attempt should be made, at least for a short time, to induce milk flow by regular stripping out. This course is usually possible in cows, and as such animals have mostly developed a good immunity they should be retained in the herd.

One has met herds built up by the purchase of slipped cows which had again bred, and abortion was not apparently a problem in such.

Contagious Abortion in Run Cattle.

The foregoing remarks have applied mainly to dairy herds. Contagious abortion may occasionally become a problem in run herds, and low-calving percentages have in several instances apparently been due to early and unobserved "slips," the fairly extensive spread of the infection in the herd being later indicated by the agglutination test.

Because of the greater grazing range usually available, the spread of infection is likely to be slower, but the same general principles would apply.

Precautions.

It will be seen from this outline of the disease that in practice under New Zealand dairy-farming conditions the eradication of the disease does not appear to offer great prospects of success. Owners are therefore advised to isolate and treat infected and aborting animals at the time of the actual abortion in order to prevent spread and secondary infection, which may cause a large percentage of the permanent sterility in our herds.

As far as possible herds should be self-maintained and self-contained. Purchased female animals should be isolated from the herd until they have calved safely. Such animals should be viewed as possible sources of introduction of fresh infection of the disease.

If this policy is followed the owner should have comparatively long periods of freedom from the disease in its most serious form. One or two abortions per season may occur among heifers during their first pregnancy, but violent storms of the disease, resulting from fresh introduced infection, would be avoided.

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Fig. 1 (above).—A paddock on Section 24s where mortality of stock, probably due to arsenic poisoning, has occurred. A strongly arsenical muddy depression is in the foreground, where the vegetation is mostly dead.

Arsenical Soils of the Waiotapu Valley.

Evidence of Poisoning of Stock at Reporoa.

R. E. R. GRIMMETT, Chief Agricultural Chemist, Department of Agriculture.

THE Reporoa Settlement is situated in a part of the Waiotapu Valley which, prior to draining, was occupied by swamp. Numerous thermal springs discharged into the swamp, chief of these being the group containing the Champagne Pool and other nearby groups drained by the Waiotapu Stream. The Waiotapu Stream meandered through the swamp, depositing silt and mineral precipitates.

Much of the present soil is composed of precipitated iron and aluminium hydroxides, and ferruginous springs depositing ferric hydroxide still bubble up in various places. Away from the river near the margins of the swamp peat overlies the mud in several areas. Slopes bounding the valley beyond the swamp are covered with deep pumice carrying in their native state a stunted manuka-manoa vegetation.

Up till some fifteen or twenty years ago the land was held in larger grazing-runs, and though a certain amount of trouble was experienced with the health of live-stock it was mainly credited to bush sickness (cobalt deficiency), which was known to occur on the adjacent pumice areas, and to Waihi disease, a form of phosphate deficiency curable by phosphatic top-dressing or by feeding phosphatic supplements.

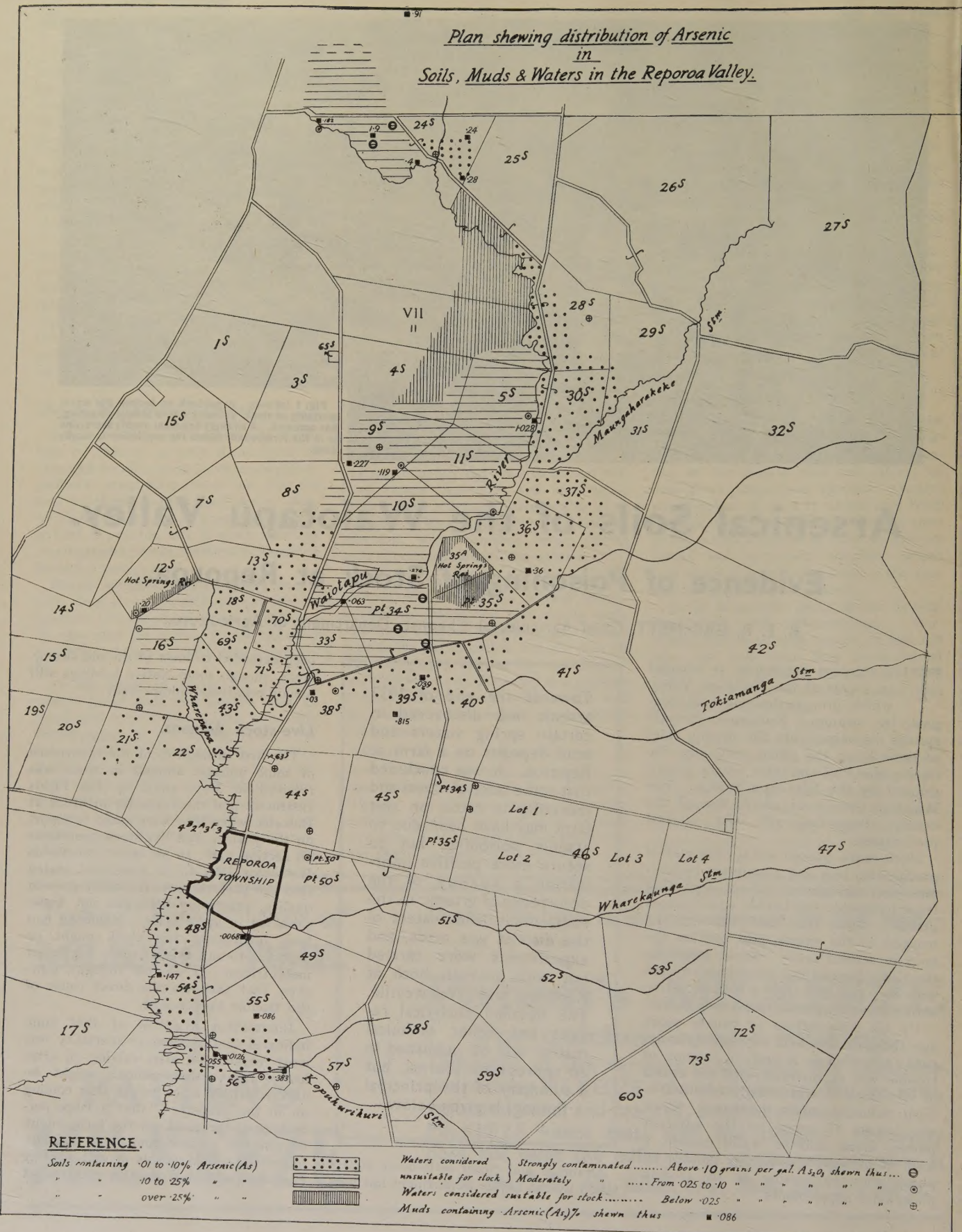
Towards the end of 1937 arsenic was discovered in certain spring waters and mud deposits on a farm at Reporoa. It was concluded that some cases of illness and mortality in cattle on this farm may have been due to arsenic poisoning, but to secure more positive information a survey of the occurrence of arsenic in the soils, muds, and waters of the district was made, and experiments were carried out with animals, both at Reporoa and Wallaceville. The detailed analytical results and other technical matter will be published in an appropriate journal, but a summary of the principal findings is given below.

Drainage and closer settlement undertaken by the Lands Department has now been extended to most of the old swamp areas, though some Native holdings still remain relatively unimproved.

Live-stock Ailment.

The first intimation of the occurrence of some unusual ailment in stock was received in May, 1937, by the Fields Instructor and the Inspector of Stock at Rotorua, when they were asked to report on the pasture and live-stock conditions on Section 24s. In his report the Fields Instructor (Mr. C. S. Dalgliesh) stated that the pastures were decidedly poor in quality, practically little else but Yorkshire fog in some fields. Manuring had been inadequate and stock might be expected to suffer from some degree of malnutrition. It was not thought, however, that this was the direct cause of the trouble experienced.

Information available at that time indicated that sickness or mortality was most frequent (*a*) after calving (*b*) after heavy rain; that animals might be affected within a few weeks after coming on to the property; that a large percentage of the stock on the farm might be affected at one time, the majority recovering spontaneously or with shifting from one paddock to another; that most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Moderately " ..... From ·025 to ·10 " " " " " "
Waters considered suitable for stock ..... Below ·025 " " " " " "
Muds containing Arsenic (As)% shewn thus ·086

of the stock were subject to an acute form of redwater; and that the drinking of water from pools in certain low-lying places or from certain drains might be connected with the trouble.

A sample of deposit or concreted material from one of the drains was forwarded by the Stock Inspector (Mr. C. H. Newson) to the Chemical Laboratory. On analysis it was found to consist largely of iron hydroxide, and contained on the dry basis 1·9 per cent. of arsenic (As). The arsenic was very soluble in dilute acid and was probably combined with the iron as arsenate and arsenite. Samples of water from the drain and of surface water were also submitted and found to contain arsenic.

Preliminary Investigations.

As the case seemed to present unusual features a field set for detecting arsenic (by the Reinsch test) was assembled and used to trace sources of contamination in the waters of drains and springs, and the area of mud and soils affected.

It was soon found that arsenical soils and springs extended over some 2,000 acres of farming land besides an undetermined area within the Waiotapu thermal and forestry reserves. Several of the mud volcanoes gave strong tests for arsenic, and the water of the well-known Champagne Pool was found to contain 0·86 grains of arsenious oxide per gallon. This pool, on account of its considerable flow, was one of the major sources of arsenic in the area.

In a number of paddocks on the swamp there are seepage areas and mud holes containing a ferruginous black ooze which in many cases is also arsenical. It was found that in some of these areas there were distinct springs containing respectively iron and arsenic in solution. Doubtless before drainage was carried out these two types of water mixed in the swamp and deposited the arsenical iron strata which underlie much of the soil.

Deposition still occurs in some of the drains, and as much as 2·5 per cent. of arsenious oxide was found in the dry material in one case. Cleanings thrown out from this drain had completely killed vegetation. Seepage areas in some cases were also sterile or had caused death to rushes and other vegetation on their margins.

In view of the high content of arsenic in the mud, and, as one spring was found containing 2·6 grains of arsenious oxide per gallon, it was considered that a definite risk of poisoning of live-stock existed. Whether such poisoning if it occurred was likely to be of the chronic, sub-acute, or acute form was open to doubt on account of the paucity and conflicting nature of many of the accounts of cases recorded in the literature.

The most definite statement confirming the existence of chronic poisoning of live-stock was that of Finlay Dunn*, who states: "Chronic arsenical poisoning with symptoms of indigestion, thirst, wasting, and chronic disease of the bones is sometimes met with amongst both cattle and horses near the tin and copper-smelting works of Cornwall and Wales."

Detailed Survey.

Up to this point no reports of unusual stock mortality had been received from other farms in the Reporoa Valley. Later, however, sensational stories appeared in the press, where it was stated that heavy losses of stock, varying from 700 to 7,000, had occurred over a period of years on some twenty farms.

* "Veterinary Medicines: Their Actions and Uses."

To investigate the position Mr. I. G. McIntosh spent six weeks determining the boundaries of the arsenical areas and the extent of contamination on each affected farm on a field-to-field basis. The accompanying map shows the results obtained in general outline.

Analyses were made of some sixty-five samples of muds and soils. Muds were found to vary in arsenic content from 0·0068 to 1·9 per cent. of As. Representative samples of the whole soil to 9 in. depth in pasture lands varied from 0·0008 to 0·525 per cent. of As. Thirty-nine samples of water from springs, streams, and surface depressions were analysed for arsenic content, which varied from a trace to 2 6 grains As_2O_3 per gallon.

It was found that fresh mud deposited on farm lands by the Waiotapu River during floods was arsenical. Both hot and cold springs contained arsenic in solution, and this was deposited from the water in one of two forms in different places—either in combination with iron

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as an arsenical limonite (probably a mixture of ferric hydrate with ferric and ferrous arsenites and arsenates), or as sulphide. In one extinct hot-springs area masses of deposited silica contain pockets of arsenious sulphide, and in an adjacent waterhole an orange-yellow crust just under the surface mud was found to consist of silica with 5 per cent. of orpiment and realgar.

In the farm lands three forms of solubility of arsenic are evident—acid insoluble, acid soluble, and water soluble—corresponding to the substances arsenious sulphide, compounds with iron, and alkali or other water-soluble salts of arsenic respectively.

Farmers were advised during the course of the survey as to likely sources of arsenic intake of animals on their farms so that they might take measures to minimize danger to stock.

Observations and Experiments.

A major difficulty in arriving at definite conclusions was the lack of material for analysis from cases of mortality in which post-mortem examination by a qualified veterinarian had indicated the likelihood of poisoning. It was therefore decided to station a live-stock officer in the district to report on the condition of farm animals during the winter and spring months, when trouble was stated to occur.

The Lands Department also arranged to set aside portion of a farm for experimental work and to purchase some half dozen healthy animals from an outside area, to graze under conditions similar to those of the stock that had previously died.

The experiments were placed under the charge of Mr. M. B. MacKenzie (Stock Supervisor), Mr. W. F. Hickey (the occupier of the farm) kindly looking after the animals. Samples of milk, urine, and other materials were secured at intervals for analysis.

The experiment and results may be summarized as follows: Two milking-cows, two yearling heifers, and two yearling steers were placed on the section on 27th April, 1938. Two animals, a cow and a steer, have remained healthy throughout (until 20th March, 1939).

One steer was drowned through getting into a ditch, but as analysis revealed a high content of arsenic in its organs it is possible that sudden unobserved illness may have occurred and precipitated the accident. One heifer became ill and died, and from the analysis of the organs is considered a case of arsenic poisoning, although a post-mortem examination by the Stock Supervisor next day revealed nothing very conclusive.

One heifer became ill, but recovered.

The remaining cow became very ill and was not expected to recover, but has done so.

This experiment thus leads to the conclusion that under conditions where the soil and drinking-water are contaminated with arsenic and no special precautions are taken to prevent the animals consuming these materials some sickness and mortality from arsenic poisoning may occur. Apparently animals confined to the same area differ considerably in discriminatory faculties in respect to grazing and drinking or in resistance to the toxic effects of arsenic.

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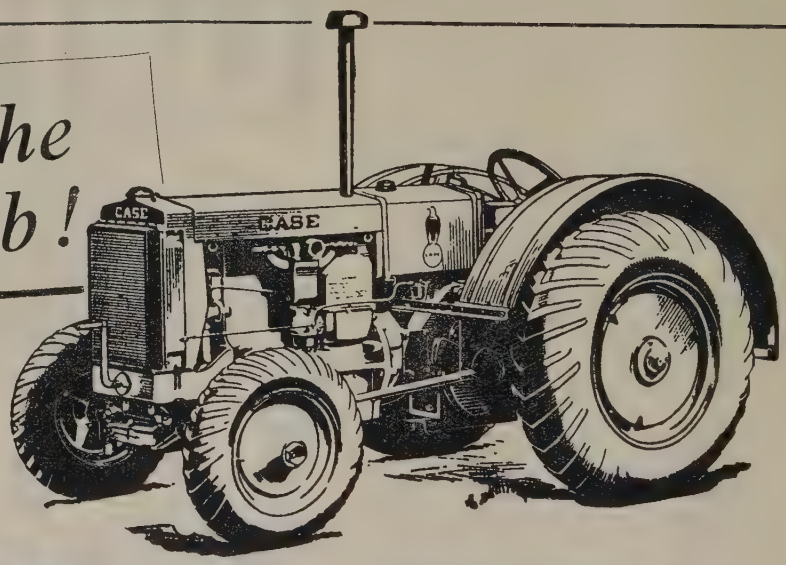

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Fig. 3.—Left: An arsenical drain on Section 24s. The first sample of arsenical mud to be received came from cleanings removed from a side drain near the pine-tree on the right. Right: An arsenical mud seepage area in manuka-covered flats. Note absence of vegetation and apparent killing of manuka. It is probable that the locations of surface outlets of such springs in the swamp shift from time to time.

The analytical data showed that the animals excreted a very variable amount of arsenic in the urine, the figures ranging from 0·34 to 5·8 mgm. As_2O_3 per 100 cc. That secreted in the milk was quite small, varying from 0·01 to 0·20 mgm. As_2O_3 per 100 cc.

The steer which was drowned contained in the liver 3·2 and in the kidney 6·0 mgm. As_2O_3 per kilo. The heifer which sickened and died had a content of 32 mgm. in the liver and 10 mgm. in the kidney of As_2O_3 per kilo. These amounts of arsenic are of the same order as those found in well-authenticated cases of arsenic poisoning.

Further Experiments.

In addition to those at Reporoa, certain experiments were also carried out at Wallaceville with the co-operation of the Assistant Officer in Charge, Mr. L. W. N. Fitch.

The first experiment was designed to determine the relation between intake of arsenic in soluble form by a cow and excretion and secretion of arsenic respectively in urine and milk, with a view to developing urine and milk analyses for diagnostic purposes at Reporoa. The results were valuable for interpreting other data, but cannot be detailed in this paper. It was shown, however, that very little arsenic passed into the milk, even when the animal exhibited evidence of poisoning (up to 0·059 mgm. As_2O_3 per 100 cc.). Arsenic in the urine rose to 5·9 mgm. per 100 cc. before the animal died, and subsequent analysis showed the liver to contain 15 and the kidney 29 mgm. As_2O_3 per 1,000 gm. (wet weight).

The second and third experiments were carried out by drenching two steers respectively with a moderately arsenical iron-oxide mud, and arsenic sulphide mud from Reporoa. The amounts fed daily contained only small (sublethal) doses of arsenic, and feeding was continued over periods of eighty-five and seventy-eight days. No apparent ill effects were produced on the animals. In the case of the iron-oxide mud frequent analyses showed that excretion of arsenic in the urine was balancing the intake. The arsenic in this form of mud was therefore readily assimilated, but in the quantity fed the animal was able to excrete it again before accumulation to a toxic level could occur.

In the case of the sulphide mud no increase of arsenic in the urine over the prefeeding period was found, indicating that this form of arsenic was unassimilable and therefore probably non-toxic.

The arsenic in the urine of the steer fed the iron-oxide mud at times reached high figures, even as much as 6·25 mg. As_2O_3 per 100 cc., but this was not maintained.

Meanwhile occurrences of mortality and sickness in live-stock generally in the Reporoa district were being investigated, and reports and specimens in connection with thirty-one cases of death were received.

Evidence of Poisoning.

Of these, some eight or nine were considered from the analytical evidence to be cases of arsenic poisoning, while the symptoms observed, including staggering, taking fits, kicking at abdomen as if in pain, frothing at mouth, redwater, together with post-mortem findings such as ulceration of stomach, petechiæ, and (somewhat inconclusively) inflammation, were consistent with this finding.

Most of the remaining animals probably died from other causes. In some cases arsenic poisoning may have been a contributory or the principal factor, but the evidence is insufficient to justify a definite conclusion.

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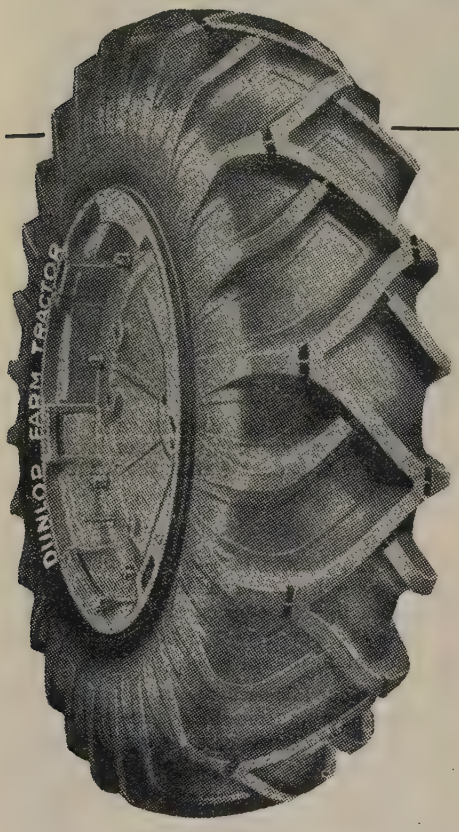

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In the nine most definite cases of poisoning the content of arsenic in the liver varied from 2·7 to 32·0 mgm., and in the kidney from 1·6 to 33·5 mgm. As_2O_3 per kilo. wet weight.

In twenty-one cases where poisoning was not considered proved the content of arsenic in the liver varied from nil to 0·7 mgm., and in the kidney from nil to 1·6 mgm. As_2O_3 per kilo. wet weight.

In the remaining case, a pig, both liver and kidney contained a high enough level of arsenic (3·3 and 5·0 mgm. As_2O_3 per kilo.) to be classed with the first group. The animal had, however, been fed skim milk through a galvanized pipe-line, and sufficient zinc was found in the organs to indicate poisoning from this source.

Bones, stomach contents, &c., were also analysed, but the detailed results must be reserved for a more technical paper.

Seasonal Variations.

In addition to specimens from dead animals a number of samples of urine were collected from both apparently healthy and unthrifty or ailing animals of the ordinary farm lands on the arsenical areas. Amounts of arsenic varying from 0·08 to 2·64 mgm. per 100 cc. were found. No close agreement between the level of arsenic in the urine and the reported condition of the animal was found. The highest levels occurred during August and September, when feed was very scarce and there was a considerable amount of surface water resulting from a prolonged period of wet and cold weather.

On one farm at this time high figures for arsenic were recorded in the urine of several cows which were in very poor condition and showed some evidence of partial paralysis of the limbs. They were stated to be licking the mud along the banks of an arsenical stream. A prolonged course of cobalt drenching failed to produce improvement. Later, with better pasture growth during November, the animals rapidly recovered coincident with a marked drop in arsenic content of the urine. Probably the more nutritive and abundant grass had enabled the animals to feed without getting so high an intake of arsenic.

This particular case was the only one found during the course of the investigation, corresponding at all closely to what was stated by several settlers to be a common and characteristic type of stock ailment in certain seasons. Known locally as "the paralysis," the condition was characterized by partial paralysis of the limbs, affections of the joints, dryness and harshness of the skin and hair, and a liability to sudden illness and equally sudden recovery, especially when moved to non-affected paddocks.

Other Possible Causes.

Besides the usual diseases of live-stock common to most localities, there are two possible sources of stock ailment in the Reporoa district apart from arsenic poisoning which require special consideration. Cobalt-deficiency is known to occur on the neighbouring pumice areas, but it is claimed by most farmers and others of long acquaintance with the district that bush-sick cattle when placed on the swamp areas recover, while cattle going sick from the "paralysis" on the swampy (arsenical) areas recover when moved to the higher and bush-sick pumice country.

Some figures for cobalt content of autumn and spring pastures on the arsenical areas were obtained and found to vary from 0·030 to 0·108 p.p.m. of dry matter, the majority being above 0·05 p.p.m. While the level of cobalt is therefore below that required for health in sheep in some cases, it is in general likely to be sufficient for cattle. Cobalt supplements have also given a negative result in several cases. A further and very significant differentiation from bush

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sickness is provided by the fact that in many cases calves are reared quite successfully and may grow into adult animals several years old and in apparently good condition before becoming sick.

Close confinement to certain paddocks where only contaminated water is available, together with the drain of liquid in milking, causing increased consumption of water and therefore of arsenic, may account in part for the apparently greater incidence of sickness among milking-cows than among other classes of livestock.

The claim has been made that *Ranunculus rivularis*, the "Waoriki" of the Maori, has caused some mortality at Reporoa. This plant occurs in small amount in certain of the less-improved swampy parts, and some 2 lb., which was all that could be found during the course of several hours collecting, when fed to a sheep by Mr. I. W. Terry, Veterinarian at Ruakura, resulted in death with symptoms and post-mortem evidence of an irritant poison.

Ranunculus rivularis grows, however, in many swampy areas in the North Island where no unusual sickness of cattle has been observed, while on several of the paddocks at Reporoa where mortality or sickness has been marked it appears to be absent.

Arsenic in Pastures and Crops.

An important point to determine was to what extent fodder plants growing on the arsenical soil might be assimilating arsenic and thus supplying it to the grazing animals. Some ten representative samples of pasture from various parts of the arsenical area were analysed and found to vary in arsenic content from 0·6 to 23 mgm. As_2O_3 per kilo. of air-dry material. The majority of the samples contained from 3 to 9 mgm. per kilo., figures very similar to those obtained from pastures in a number of other localities in New Zealand. While the pasture containing the highest amount might in time produce a toxic effect, this appears to have been an exceptional sample, and such levels are likely to occur only in very restricted areas.

Samples of oaten straw and grain from a crop grown on arsenical soil contained only 4 and 3 mgm. As_2O_3 per kilo. respectively and were thus considered quite safe for stock.

Brief mention may be made of some points bearing on the form in which arsenic is present and possible changes which may occur rendering it more or less toxic.

While most authorities state that arsenic is more toxic in the trivalent (arsen*ious*) than in the pentavalent (arsen*ic*) form, this is only partly true of the inorganic or mineral compounds. Differences in solubility and hence assimilability may account for much apparent difference in toxicity, while compounds such as sodium arsenite are corrosive and irritant by reason of their caustic alkaline nature as well as from their arsenic content.

The ease with which arsenic compounds can be reduced to the arsenious form by decomposing organic matter, for instance, also strengthens the view that any readily soluble compound of arsenic should be regarded as potentially poisonous.

The arsenic in solution in spring or surface waters and that deposited in mud and soil is likely always to be present in both the oxidized or *ic* and the reduced or *ous* forms, the relative proportions of each depending on the balance of oxidizing and reducing agencies operating at any given time. The chief oxidizing agency is the oxygen of the air, while reducing agencies include decaying vegetation and various micro-organisms, especially when the soil is water-logged and normal aeration prevented. It may thus happen that weather conditions influence both the amount and toxicity of the arsenic dissolved in water percolating through the swamp deposits, as well as the solubility and toxicity of that present in the deposits.

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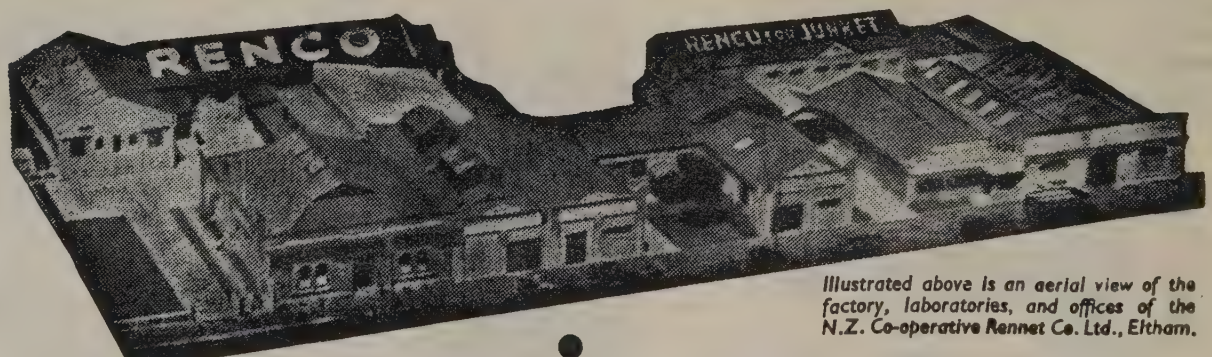

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Effect of Drainage.

The aeration consequent upon drainage and cultivation should oxidize the arsenic in the soil and render it insoluble. Water-logging on the other hand may result in the arsenic becoming reduced and more soluble in the soil water.

It is known also that certain organic and some volatile compounds of arsenic such as diethylarsine may be produced by the action of moulds on organic matter containing arsenic and are intensely poisonous even when inhaled, having a somewhat different action on the organism from inorganic arsenic. It is possible that such compounds may be produced in decomposing swamp vegetation or in mouldy hay which has been gathered in a muddy or dusty state, thus being contaminated with arsenic from the soil.

Mention has at times been made, both by departmental officers and by settlers, of mortality having followed the use of poorly saved and mouldy hay at Reporoa. Should any such case again occur the Department would welcome its being brought under notice.

Recommendations.

The general finding of the present investigations is that though arsenic is of widespread occurrence in the spring and drainage waters and the soils of the lower-lying portions of the Reporoa settlement it is only responsible for a small annual mortality, together probably with a further but undefined amount of unthriftiness in live-stock.

The greatest dangers are (1) to animals grazing along the muddy banks of streams and ditches, (2) from their drinking water from arsenical springs or streams, and (3) from grazing or drinking in certain small areas where drainage does not remove surface water or water seeping up through the old swamp deposits.

Clean-growing pasture on arsenical soil—*i.e.*, where mud from flooding or dust, &c., has not contaminated it—contains normally too little arsenic to have any toxic effect, and crops such as oats are also harmless.

It is therefore recommended that farmers fence off all areas indicated on the map where arsenical springs occur, or where the mud along drain or stream edges is strongly arsenical, also any small depression in the paddocks where surface waters lie causing the grass to die and an oozy mud to develop.

The majority of the analytical work summarized in this article has been performed by Mr. I. G. McIntosh, Miss E. M. Wall, and Mr. G. B. Jones. The Wallaceville experiments were under the direction of Mr. L. W. N. Fitch, Assistant Officer in Charge. Detailed acknowledgments will be made in a later technical article, but the author desires to record his indebtedness to officers of the Agriculture and Lands and Survey Departments who co-operated in the work, and to the settlers of Reporoa who assisted in a variety of ways.

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Half-yearly Fertilizer Returns, 1938.

THE following returns from July to December, 1938, have been compiled by the Inspector of Fertilizers, Fields Division, Department of Agriculture, from figures furnished by courtesy of the Comptroller of Customs :—

Fertilizer.	Origin.	July.	August.	September.	Quarter.	October.	November.	December.	Quarter.	Half-yearly Return.
Phosphates—		Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Rock	Gilbert and Ellice Islands	8,231	7,311	6,027	21,569	4,425	1,996	2,745	9,166	30,735
	Nauru	23,309	14,432	22,250	59,991	9,738	24,296	7,484	41,518	101,509
Total		..	..	..	..	..	..	..	..	132,244
Slag	Belgium	425	200	115	740	25	125	400	550	1,290
Guano	New Caledonia	225	..	..	225	..	505	200	705	930
	Seychelles	..	7,688	3,941	11,629	1,137	..	..	1,137	12,766
	United Kingdom	..	20	..	20	..	..	7	7	27
Total		..	..	..	..	..	..	..	..	13,723
Other phosphates	United Kingdom	..	..	..	..	..	..	..	..	..
	Belgium	425	100	50	575	25	2	..	27	602
	Finland	..	..	5	5	1	..	..	1	6
	Egypt	..	2,215	..	2,215	..	..	..	..	2,215
Total		..	..	..	..	..	..	..	..	2,823
Total phosphates		..	..	..	..	..	..	..	..	150,080
Potash—										
Kainit	Germany	..	..	45	45	..	..	..	..	45
	France	..	..	25	25	25	..	..	25	50
Total		..	..	..	..	..	..	..	..	95
Sulphate	France	60	20	25	105	30	..	..	30	135
	Germany	60	100	65	225	80	10	20	110	335
Total		..	..	..	..	..	..	..	..	470
Muriate	Germany	185	..	105	290	..	..	70	70	360
Other potash	France	100	165	305	570	1,000	375	20	1,395	1,965
	Germany	91	785	350	1,226	355	536	205	1,096	2,322
Total		..	..	..	..	..	..	..	..	4,647
Total potash		..	..	..	..	..	..	..	..	5,212
Nitrogen—										
Sulphate of ammonia	United Kingdom	1,145	527	473	2,145	250	325	25	600	2,745
Nitrate of soda	Chile	608	298	19	925	5	522	140	667	1,592
	United Kingdom	..	..	..	..	..	5	..	5	5
Total		..	..	..	..	..	..	..	..	1,597
Total nitrogen		..	..	..	..	..	..	..	..	4,342
Char dust and bone char	Australia	100	77	..	177	..	..	..	..	177
Miscellaneous	United Kingdom	102	36	7	145	9	21	..	30	175
	Australia	5	17	..	22	..	2	2	4	26
	United States of America	..	..	..	..	1	..	..	1	1
	India	..	..	3	3	..	..	..	..	3
	Rhodesia	..	..	1	1	..	..	..	..	1
Total miscellaneous		..	..	..	..	..	..	..	..	206
Totals		35,071	33,991	33,811	102,873	17,106	28,720	11,318	57,144	160,017

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Tree-planting for Farm Shelter and Shade.

Fig. 1.—A section of a typically well-sheltered farm in the Whakatane district.

Guide to Obviating Common Mistakes Which Cost Time and Money.

C. R. TAYLOR, Fields Instructor, Whakatane.

MAY is very generally regarded as a most suitable month to begin tree and shrub planting operations, and many farmers will have in mind at least an extension of their shelter-belts and plantations, as well as the provision of a few more shade trees at selected sites on the farm.

Figure 1 shows a section of a typically well-sheltered farm in the Whakatane district. In the background can be seen a breakwind of Eucalypti and *Pinus radiata*, with a row of *Cupressus lawsoniana* on the inside, which furnishes bottom shelter and prevents dangerous draughts. On the right is a well-grown barberry hedge, and in the middle foreground can be seen a shade tree in the early stages of growth. Note particularly the protection against damage by stock.

This article has been written in the hope that it will not only prove of interest to the casual reader, but that, more particularly, it may lead to this essential work being undertaken in such a manner as to avoid at least a number of the more common errors which invariably creep into tree-planting on the farm and which are not realized until several years have elapsed, when it is discovered that the trees and shrubs have not done as well as anticipated or have actually died out altogether.

Salient points connected with tree-planting are discussed in this article to assist in obviating those mistakes which frequently culminate in disappointment and much loss of valuable time. In view of the close relationship between shelter and shade and the health and productiveness of live-stock and pastures every effort should be made to provide this necessary auxiliary as quickly as possible.

It is not the purpose of this article to emphasize the benefits of shelter and shade on the farm, as much of this ground was covered in an article prepared by the writer for the July, 1938, issue of the *Journal*, and, moreover, such is undoubtedly apparent to every farmer. Rather, however, is the purpose to stress a few of the salient points connected with tree-planting in order to obviate those mistakes which frequently culminate in disappointment and much loss of valuable time.

Probably one of the principal errors committed by farmers and others contemplating the growing of trees and shrubs for any purpose is that associated with the selection of varieties. All too frequently one hears of instances where a certain kind of tree or shrub grown by a person in one district has appealed to a farmer from a different locality, and the latter has immediately proceeded with the planting of the variety of his fancy without giving a moment's thought to the vital question of whether his soil and climatic conditions, &c., are suited to the growth and normal development of the plant in question.

On many occasions success is achieved, but disappointments can, and quite frequently are, just as prevalent—and all because due consideration was not given to the essential requirements of the variety of plant that was planted.

In this respect plants differ little from animals, and just as we are prepared to study the requirements of the animals to enable them to remain healthy and capable of a high level of production, so must we carefully study the requirements and characteristics of plants if we desire to secure the best possible results consistent with our endeavours in general.

Thus, no experienced sheep-farmer would even dream of trying to farm Merino sheep on low-lying, marshy country, because he would know that in such an environment they would not thrive and he would be courting disaster by doing so. Similarly, no orchardist of any experience would attempt to grow citrus fruits in localities where frosts are severe over a prolonged period, simply because he, too, would know that such plants are definitely unsuited to such conditions.

And yet how many people bring to the important task of tree-planting for shelter and shade purposes a comparable degree of knowledge of the requirements of these plants? Very few indeed, judging from the poor results one observes only too frequently.

Securing Results.

What then must be done to be reasonably certain that the results of one's efforts in providing shelter and shade on the farm will be satisfactory? The answer is simple. First, it is important to have a clear idea of the purpose behind the proposed work—*i.e.*, whether the hedge required is to be tall or short, fast-growing or slow, permanent or temporary, stock resistant or not, and so on.

The next point is to consider carefully the characteristics of a number of tree and shrub species thought likely to fulfil the purpose in view. It is very necessary to take into consideration such factors as climate, soil conditions, elevation, proximity to sea-coast, and consequent salt-laden winds, and all other circumstances that may have a bearing on the proper growth and development of plants before the final selection is made.

For sake of illustration, the popular *Cupressus lawsoniana* requires for optimum results a fertile, well-drained, free-working soil, a cold winter climate and generous rainfall—*i.e.*, well distributed. It dislikes high mean temperatures, excessively salt-laden winds, and water-logged soils. The latter condition will actually kill the plant (see Fig. 8). On the other hand, *C. benthamii*, a somewhat similar tree, will thrive well under the very conditions that retard the growth and perhaps destroy *C. lawsoniana*.

For dry, rather poorish soils near the sea-coast *C. macrocarpa* is an ideal tree to grow for certain purposes, and its timber is useful for firewood and fencing-materials. One could quote such examples indefinitely, but as it is really outside of the scope of these notes to do so the writer seriously recommends farmers and others contemplating tree and shrub planting this coming season to get in touch with the local Instructor in Agriculture for their district, who is well equipped to render valuable assistance in this matter.

Common Error.

Another very common error is that connected with a natural desire for quick results. Where a permanent and easily kept hedge is required it is futile to plant something that grows quickly, for to do so often defeats the object of the planting scheme and is the cause of many later regrets. Much can be done, however, to speed up the growth of the slower-growing varieties of trees and shrubs by giving careful attention to cultivation, manuring, and proper root arrangement when placing the plants in the holes or pits prepared for them.

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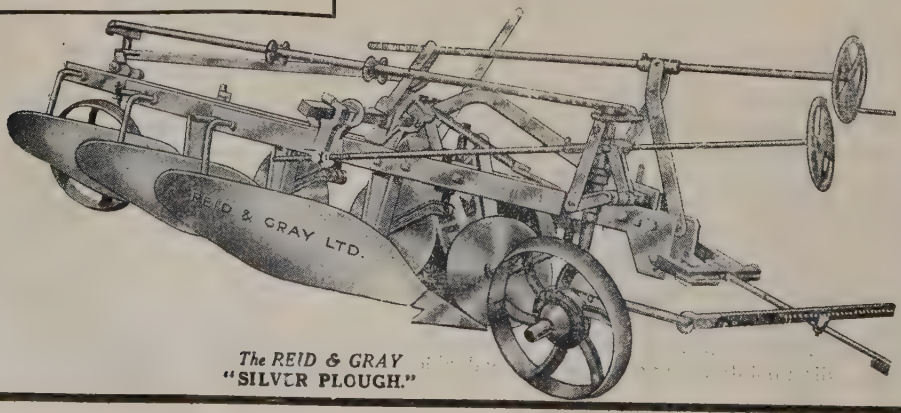

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Fig. 2.—A well-sheltered homestead standing on what was once a barren, bleak, undrained swamp. This illustrates the change brought about in only twenty years, and indicates clearly the vast possibilities in farm shelter and shade projects. The Eucalypti at the back of the house are several chains from it and on the south side. Note the shade trees in the foreground and the sheep sheltering in the shadows.

Fig. 3.—A homestead and farm which could with advantage be provided with a measure of shelter and shade. Unfortunately, such sights are by no means uncommon in some districts, and must react to the detriment of the occupier and his stock.

Fig. 4.—An odd pine or two scattered about the farm provides very efficient shade during the hot summer months and greatly adds to the comfort of the animals.

Fig. 5.—Many a farm could have been provided with natural shelter and shade had a little foresight been used during the period of development. Here is a corner of a farm broken in from manuka a few years ago and left with a small patch of manuka to provide a measure of comfort for the stock. Note the sheep sheltering from the hot sun.

Fig. 6.—The initial stage in sheltering an exposed and bleak hillside. The trees, which are *Cupressus lawsoniana*, are planted about 6 ft. apart and are double-fenced to prevent stock damage.

Fig. 7.—A single row of *Cupressus lawsoniana* planted around a homestead last May. In spite of an abnormally dry summer they have almost doubled their height in twelve months. They are planted 3 ft. apart, and it is intended to keep them about 4 ft. high by careful trimming.

Weeds and grass should be kept well away from the young establishing plants until they are standing well above the harmful shading and nutrient-robbing influence of extraneous vegetation. Adequate protection from stock is also very necessary to the rapid growth and general well-being of all hedge plants and isolated shade-tree specimens, and without this protection it is simply waste of time and money attempting tree and shrub establishment, as the result, even if partially successful, is really very inefficient and unsightly.

Among the many mistakes made when designing a shelter-hedge project can be numbered the one that provides ultimately too much shelter, and this fault is frequently observed in the vicinity of homesteads. Never plant tall-growing trees close to the house or other buildings unless they will stand cutting back to 10 ft. or 12 ft., and the farmer or occupier should see that this job is done whenever necessary. A house surrounded by tall trees is definitely unhealthy, as they shut out the beneficial sunshine and keep the place damp, especially in winter. Moreover, in such circumstances it is extremely difficult to get flowers and vegetables to grow well.

Admittedly it is not the easiest matter always to visualize how a shelter-belt will appear when fully matured, but if at all in doubt the wisest course is to set out the plants a greater distance from the buildings than is thought to be necessary. Such a procedure will ensure adequate shelter in the years to come without the risk of over-sheltering.

The Actual Plantings.

Finally, there is the actual planting of trees and shrubs intended for shelter and shade purposes on the farm. Some farmers merely dig a hole in the turf, carelessly push in a young plant, fill in the hole, and continue in this way until the job is completed. From then onwards the plants are expected to battle along as best they can and in due course produce a presentable sort of a hedge. This is a poor way of going about such an important undertaking, and certainly not conducive to the best results, although, unfortunately, too often indulged in.

Fig. 8.—The undesirable effect produced by planting hedge plants in situations unsuited to their development. All the trees on the right, growing in a slight hollow, are dead, while those on the left, occupying higher and drier ground, are thriving normally.

It would be better to prepare the holes or pits some weeks before planting and work a little blood and bone and superphosphate into the soil at the bottom of the pits, which should be large enough to accommodate the plant-roots when drawn out in all directions from the stem and sufficiently deep to enable the plants to be buried to a depth similar to that occupied when they were in the nursery rows. Usually a mark on the stem clearly indicates this position.

The soil should then be drawn carefully around each plant and tramped fairly firm, especially if naturally light and dry. No part of the turf should be returned to the pit, as this may cause air pockets and consequent drying out of roots—a very prolific cause of failures. Care also should be taken to see that the roots are kept in a thoroughly moistened condition; otherwise a high plant mortality will probably be the outcome.

Control of Weeds.

Following establishment, it is most essential that weeds, &c., be controlled for a few years, and the best method of ensuring this is to dig around each plant from time to time an area fully 3 ft. in diameter. For main breakwinds where three or four rows of trees are being employed it is best to plough and thoroughly cultivate a strip of land and then proceed as outlined above. Rows of potatoes could then, if desired, be grown between the rows of trees for a year or two and the cultivation and manure given to them would vastly assist the rapid growth of the trees.

If the foregoing instructions are conscientiously carried out no difficulty should be experienced in securing a really first-class result, and in view of the very close relationship between shelter and shade on the farm and the health and productiveness of live-stock and pastures, &c., every endeavour should be made to provide this necessary auxiliary as quickly as possible, remembering at all times that "If a job is worth doing it is worth doing well."

Fig. 9.—A fine shelter hedge of bamboo. It is quickly grown, very handy, and impenetrable to stock. It needs thinning from time to time, as it is inclined to take up rather much ground if left unattended.

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Evolution of the Milking Shed.

Effect on Production of Milk and Cream.

Contributed by the DAIRY DIVISION.

FROM the explanations given in the previous talk on the Dairy Industry Act, 1908, so far as it directly affects the supplier of milk and cream, it will have been gathered that the instructional staff of the Dairy Division are required to act both as instructors and inspectors in their dealings with the dairy-farmer.

Of the two duties, that of instruction is regarded by the Department as the more important, and it is fully realized that no good work can be accomplished without co-operation and goodwill between farmer and instructor. It is true that there are certain laws and regulations which intimately concern the dairy-farmer, and it is the duty of the Farm Dairy Instructor to administer them, but, as in every walk of life, few of these press unduly on the average man.

Dealing with the evolution of the milking-shed, this is the third of a series of articles by the Dairy Division on the production of milk and cream for factory supply.

Attitude of Suppliers.

In the great majority of instances all that is required is to point out the fault, and it is willingly remedied. The attitude of the supplier who complained that the Farm Dairy Instructor had not left a report on his dairy after visiting it is a good illustration of the attitude of most suppliers.

"If," wrote this supplier, "there is anything wrong I want to know about it so that I can have it put right. If everything is all right I still want to know about it, as I am pleased to have the assurance that everything is as it should be."

While the erection of an elaborate milking-shed does not necessarily ensure a good quality of milk or cream, it is equally true that a poor shed makes difficult the production of good-quality milk and cream. On the other hand, the term "a good shed" is not easily defined, as the size of the herd and the conditions under which milking must be carried on vary tremendously.

A shed on a bush farm in the early stages of its development, in which a small number of cows are to be milked by hand and the milk separated in a nearby separator room, could probably be regarded as a good one provided it had a sound concrete floor and good drainage.

Open-air Milking.

Even open-air milking without a shed at all, which makes it possible to move around and so avoid the necessity for a permanent yard, has been practised by many dairy-farmers when making a start on a new section. In many cases little fault could be found with the cream produced. In such instances it will be found, as a rule, that scrupulous attention has been paid to the care of the utensils and the method of milking.

Then we have the supplier on a small area, or one whose principal interests are devoted to other lines of farming. In these cases the equipment is usually simple, and the quality of the cream produced again depends on the amount of care and attention paid to the cleanliness of the utensils and the milking.

The position is very different on what may be termed a commercial dairy-farm, where a large number of cows are milked. Provision must be made for surroundings which will stand up to the traffic in wet weather and for hot and cold water in comparatively large quantities, while speed of handling with a minimum of labour is the main objective. The requirements laid down in these circum-

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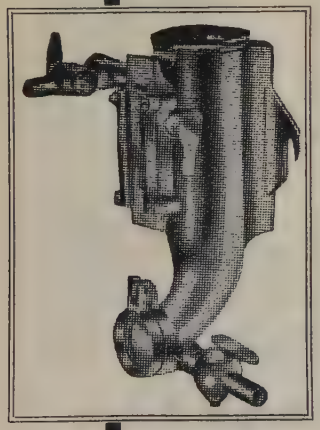

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stances are obviously more exacting, they are the result of the experience gained over a long period, during which the expansion of the industry has been so rapid that the equipment has quickly become inadequate. For these reasons the Dairy-produce Regulations 1938 cover many points dealing with the erection and equipment of dairies, points which experience has shown to be essential in order to safeguard the quality of the milk and cream produced in them.

Winter Dairying.

Before the establishment of dairy factories and freezing-works the supply of butter for winter use in the Dominion was dependent to a great extent on winter dairying, and on many farms the number of cows milked varied little the whole year round. A number of cows were brought in during the autumn months in order to maintain the output of butter which, at that season, realized prices greatly in excess of those received during the summer.

In the absence of cold storage a certain amount of the summer surplus was heavily salted and packed in kegs or earthenware crocks, and those who remember it will vouch for the statement that some of this butter was not a very attractive substitute for the freshly-made article. Even the winter-made butter was frequently so tainted with the flavour of turnips that it was most unpalatable.

The winter herd was, in practically all cases, fed in the shed while being milked, and on many farms in the South Island the whole herd was kept in the shed overnight.

Type of Building.

The type of building in almost general use was of two stories. The milking-shed was below with a row of either single or double bails, and the hayloft was above. Bails in most instances were of the lever type, but in those sheds where the cows were stalled overnight a collar and chain attached to a long staple were used to allow freedom for the cows to lie down.

When the cows were not stalled at night, relays were brought in from the yard at intervals in order to allow an equal feeding-period to each cow. When cows were stalled it was necessary to provide a stall for each cow in milk, and instances were not uncommon where no yard as at present known was provided. The reason was that the milking-shed formed one of a group of farm buildings, or was even attached to them, a common yard being used for all stock.

The straw bedding which was provided for the cows kept in overnight gave a supply of manure for use in the growing of the farm crops.

Labour Employed.

The amount of labour employed on farms where winter dairying was carried on and supplementary feeding was required was, of course, much greater than would be needed to-day for a herd of a similar size, and as milking-machines were not used the employees were available for hand milking. The number of bails in the shed was in excess of present-day requirements, as the milking was slower and time was thus available for the cows to feed.

From a hygienic viewpoint the conditions under which milk was produced in this closed-in type of shed, with its contaminated atmosphere and the presence of dust from the hay, cannot be compared with the present type of shed, with its good ventilation and exposure to the sun between milkings, and the ease with which the shed can be washed out and allowed to dry.

It will perhaps be of interest to state that during recent months overseas dairying journals are giving prominence to the suggestion that milking-sheds, apart from feeding-sheds, should be provided on dairy-farms in the United Kingdom in order to assist in the production of high-quality milk under the accredited milk scheme.

Under present-day conditions of dairying no special provision is required for the winter supply of butter, and it is probably correct to say that practically the only winter dairying which is carried on apart from milk for city supply is the result of cows coming in late and having

(Continued on opposite page.)

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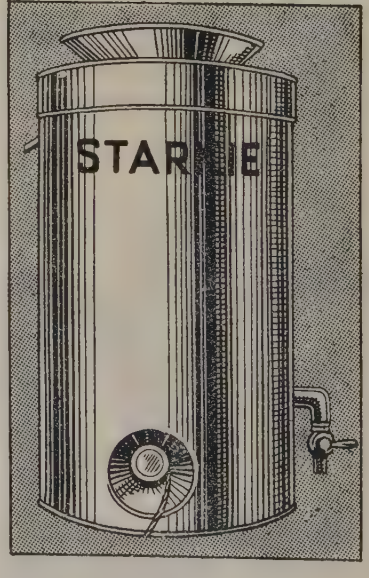

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Handling of Bobby Calves.

Prevention of Damage to Skins Is of Vital Importance To All Associated with the Industry.

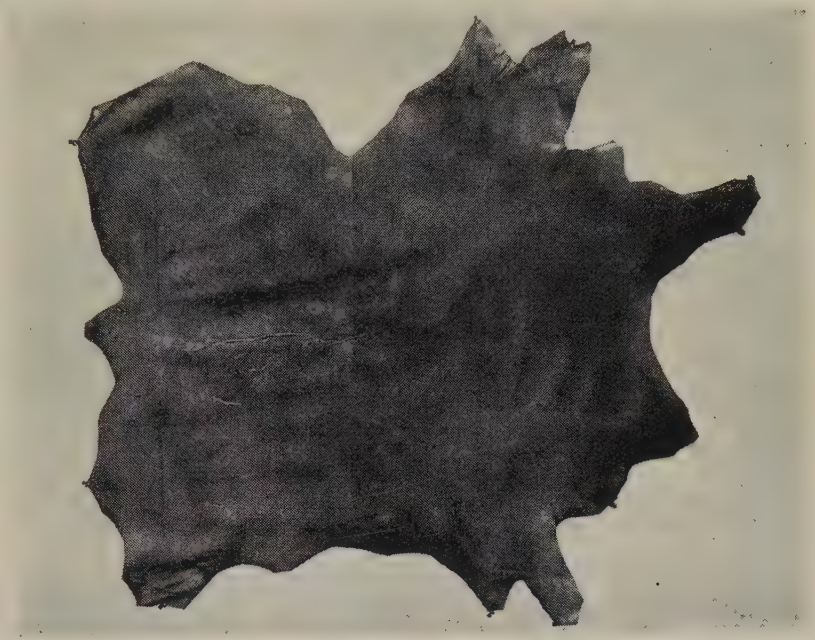
Contributed by the NEW ZEALAND STANDARDS INSTITUTE.

STRONG complaints have been received by the New Zealand Standards Institute from overseas buyers and users of the damaged condition of New Zealand calf-skins. These representations have been referred to the Hides Committee of the Institute, which is representative of all affected interests.

After full consideration of the matter the Committee finds that the damage in the grain of the skins by scratches, cuts, bruises, and other irremediable marks, which are revealed after the removal of the hair, is for the most part due to insufficient care in handling bobby calves prior to their slaughter.

As the skin constitutes approximately half the value of the bobby calf it will be appreciated that the prevention of damage is of vital importance to all associated with the industry. The value of the skin is dependent upon the preservation of the grain surface, without which it cannot be utilized for the most valuable purposes in the tanning industry.

After a careful examination of the circumstances and factors involved the Committee has decided that the position cannot be met by amending the provisions of the relevant New Zealand Standard Specification, for the reason that the damage results from general causes which cannot be covered or defined in the standard specification.



An example of the damage done to bobby-calf skins through careless handling of the animal before slaughter.

The Committee has therefore directed that, in the interests of the industry generally, the attention of the affected parties should be drawn to what it considers the major causes responsible for the damage to the skins, and that the co-operation of all connected with the bobby-calf trade—and, in particular, farmers, collectors, lorry-drivers, truckers, and drovers—be sought in preventing damage by taking the following precautions.

On the Farm.

(*a*) Avoid leaving newly born calves in rough growth near barbed fences or bringing them into the steading in a conveyance with rough surfaces.

(*b*) Avoid putting the calves temporarily in a shed or other holding-place with projecting nails, broken surfaces, or implements upon which they can do themselves damage.

(*c*) Avoid putting the calves at the roadside in pens which have rough projections, or tying them where they can damage themselves against barbed wire, gorse, barberry, blackberry, or other brambles, &c.

In Transport.

(*a*) Avoid the use of lorries with decks too low for the animals to stand upright without chafing on the back.

(*b*) Do not use lorries with rough surfaces or projections which would bruise or scratch the skin.

(*c*) Avoid pushing the calf through doorways which are so small as to bruise the skin.

(*d*) Avoid rough handling of the calf in the railroad trucks or the use of sticks, wire, or anything of that kind to push or prod the calves in the loading or unloading.

(*e*) Allow no dunnage or other obstruction in the trucks or lorries which would bruise the calves if they lie down or are thrown about in course of truck or rail transport.

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EVOLUTION OF THE MILKING SHED.

(*Continued from page 398.*)

to be carried over the winter. The amount so produced, if it were all put on to the local market, would probably suffice for its needs, but stocks are always available from the summer carry-over held in cool store where and when required.

Dairy-farming has, under these conditions, become a specialized industry extending approximately from August to May, and the general layout of the milking-shed and its equipment is designed to provide rapid handling of large numbers of cows with a minimum of labour. For this purpose the walk-through shed, generally with an open front, has proved to be the most popular among dairy-farmers in the Dominion.

The next article by the Dairy Division will deal with the design of the milking-shed.

✣ ✣ ✣

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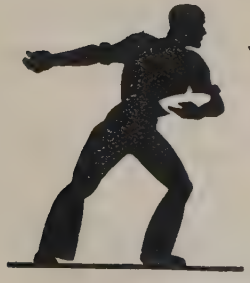

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Rate of Sowing Wheat.

Nothing to be Gained by Reduction of Seed Below 120 lb. per Acre.

J. W. WOODCOCK, Crop Experimentalist, Fields Division.

THE usual rate of seeding for wheat varies considerably from district to district. Several factors cause such variations in practice, the chief being the time of sowing. Thus, in Canterbury and North Otago, where crops are generally autumn sown, the average rate of seeding is from 1 bushel to 1¾ bushels per acre, whereas in South Otago and Southland, where crops are spring sown, the average seeding is from 2 bushels to 3 bushels. The variety sown also has some bearing on the rate of seeding, for good-tillering varieties such as Hunters are usually sown at a lower rate than others.

In the past allowance has been made in some districts for "pickling," and where the older methods of seed treatment for control of smut, such as bluestone or formalin, were employed higher quantities were used to counteract the deleterious effect on germination. The new organic-mercury dusts such as Ceresan or Agrosan, however, are now advocated for treating all cereals, and these are believed to assist rather than depress field germination.

Effect of Seeding on Quality.

One argument in favour of reducing the rate of seeding has been to the effect that a reduction in the amount of seed applied tends to improve the "sample" of wheat harvested. With this theory in mind quite a number of wheat-farmers in Canterbury sow wheat as low as 75 lb. per acre, and maintain that a more attractive sample of a higher bushel weight is secured. Others are quite definitely of the opinion that small-seeded varieties such as Marquis can be sown at a lower rate, presumably because more seeds are being applied to a given area.

It was this disparity in the size of grains from different varieties which led to several departmental trials being carried out, because this question cropped up repeatedly when variety trials were to be sown. Hudson and Stafford* after several years work on the subject published initial results and came to the following conclusion :—

Experiments conducted in Canterbury have provided evidence that in the autumn sowing of wheat-seed the best results are obtained with 120 lb. per acre. The trials have also indicated that there is nothing to be gained by a reduction of seed below 120 lb. per acre on the score of "sample" or the attractiveness of the grain.

> "The rate of seeding of wheat may be in excess of the optimum by a reasonable amount (say 20 lb. to 40 lb. per acre) without the yield and quality of the grain being appreciably different from those resulting from the optimum seeding."

They also came to the conclusion that size of grain was no guide to rate of seeding. Consequently, the practice of sowing all varieties in variety trials at the same rate of seeding and at a rate 20 lb. to 40 lb. per acre in excess of the estimated optimum of the standard variety was considered to be justified. Usually the seeding of all varieties in such experiments is at 2 bushels per acre.

Hudson and Stafford quoted at some length the comments of Dr. F. W. Hilgendorf, Director of the Wheat Research Institute, who was inclined to the opinion that the thicker rates of sowing tended to counteract the imperfections of the drill. Where seed was drilled at a low rate innumerable spaces occurred in which there were no plants, the number of blank spaces decreasing with increased rates of seeding. Dr. Hilgendorf considered that one of the quickest ways of improving wheat yields was to improve our drills, and that when drills and drilling were more perfect, thickness of sowing would become of much less importance.

Further Trials.

With the object of investigating the question further, seven experiments were sown and harvested by officers of the Fields Division in 1933–34 and six in 1934–35. They were all laid down in various farms in Canterbury and North Otago. In the former series rates of sowing of 60 lb., 90 lb., and 120 lb. per acre were compared, while in 1934–35 an additional rate—*i.e.*, 150 lb. per acre—was included.

In order to attain a high degree of accuracy twenty replications of plots were sown on each trial and germination counts were made about two months after sowing. There was a high degree of correlation between the rates of sowing and the

* A. W. Hudson and W. C. Stafford "The Rate of Seeding of Wheat in Relation to Variety Trials," *Empire Journal of Experimental Agriculture*," Vol. II, No. 5.

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numbers of plants, the percentage of seedlings to seeds sown being about the same in each trial. (The field germination expressed as percentage of seeds sown ranged from 50 per cent. in some trials to 80 per cent. in others.)

Experiments in 1933–34.

The yield results of the 1933–34 season are shown in Table 1 :—

With one exception (experiment 2) the heavier seeding was accompanied by increased yields, although in one instance the increase of the high over the medium seeding was not significant. The depression from the 90 lb. seeding in experiment 2 appears anomalous in view of the increased yield from the 120 lb. seeding and is difficult to explain.

Table I.

(Yields in bushels per acre from different rates of seeding of wheat.)

Name of Farmer.	Yield in Bushels per Acre.				
	60 lb. Seeding.	90 lb. Seeding.	120 lb. Seeding.	Increase of 90 lb. over 60 lb.	Increase of 120 lb. over 90 lb.
1. High School, Rangiora	40·0	43·5	45·4	3·5 (S.)	1·9 (S.)
2. Mulholland, Darfield	30·6	28·6	32·0	−2·0 (S.)	3·4 (S.)
3. F. Carpenter, Prebbleton	30·2	32·9	35·0	2·7 (S.)	2·1 (S.)
4. A. Amos, Wakanui	27·2	30·8	32·4	3·6 (S.)	1·6 (S.)
5. Mrs. Hall, St. Andrews	20·5	21·4	23·3	N.S.	1·9 (S.)
6. A. B. Timblick, Hilton	25·9	27·9	29·0	2·0 (S.)	1·1 (S.)
7. J. D. Grant, Awamoa	49·1	51·1	51·7	2·0 (S.)	N.S.

Differences denoted by (S.) are statistically significant. Those marked N.S. are not significant, and any such increases or decreases are not considered due to treatment.

Comments on Table I.

Details of varieties sown and dates of sowing were as follows :—

Trial 1 : Tuscan sown 21st June, 1933.
Trial 2 : Tuscan sown 22nd May, 1933.
Trial 3 : Tuscan sown 19th May, 1933.
Trial 4 : Tuscan sown 16th June, 1933.
Trial 5 : Tuscan sown 20th June, 1933.
Trial 6 : Tuscan sown 15th June, 1933.
Trial 7 : Hunters sown 18th May, 1933.

Examination of Grain Samples.

Representative samples of grain were kept from each treatment in the above trials for determination of bushel weights and for grading. The latter was performed by two competent judges, Mr. J. Ireland, Manawatu Mills, Palmerston North, and Mr. J. G. McKay, Department of Agriculture, Christchurch, who carried out similar tests in the experiments reported by Hudson and Stafford.

A summary of the bushel weight determinations was as follows :—

90 lb. seeding compared with 60 lb.—equal in one trial, higher in three trials, lower in three trials.
120 lb. seeding compared with 60 lb.—equal in three trials, higher in one trial, lower in three trials.
120 lb. seeding compared with 90 lb.—equal in three trials, higher in one trial, lower in three trials.

Differences, however, in all trials were slight, and amounted to only 1 lb. in the extreme case, trial 6 (bushel weights in this trial were 60·67 lb., 61·13 lb., and 60·12 lb. for the 60 lb., 90 lb., and 120 lb. sowings respectively).

In commenting on the appearance of the various samples, Mr. Ireland stated : " There is very little difference within any of the lines. The difference is so small that it is hard to set a value on it."

Mr. McKay's comments were : " In practically all cases differences between samples within each trial are unappreciable." The judges were not aware of the treatments represented by the various samples. From their remarks it was obvious that there was no real difference in the outward appearance of the grain from the various sowings.

Experiments in 1934–35.

The yields obtained from the five trials sown in 1934–35 are given in Table 2 :—

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Table 2.

(Yields in bushels per acre from different rates of seeding of wheat.)

Name of Farmer.	Yields in Bushels per Acre.				Increases in Yield.		
	60 lb.	90 lb.	120 lb.	150 lb.	90 lb. over 60 lb.	120 lb. over 90 lb.	150 lb. over 120 lb.
1. D. Spence, Sherwood	11·2	12·4	13·0	13·5	1·2 (S.)	0·6 (S.)	0·5 (S.)
2. C. A. Campion, High-bank	15·5	18·5	20·4	22·0	3·0 (S.)	1·9 (S.)	1·6 (S.)
3. G. C. Warren, Darfield	13·9	16·5	15·9	18·0	2·6 (S.)	−0·6 (S.)	2·1 (S.)
4. Cant. Seed Co., Leeston	36·3	37·7	36·9	41·6	N.S.	N.S.	4·7 (S.)
5. W. H. Simpson, Island Cliff	34·5	33·4	35·4	33·7	N.S.	2·0 (S.)	−1·7 (S.)
6. W. S. Stevenson, Incholme	30·4	33·4	33·1	34·0	3·0 (S.)	N.S.	0·9 (S.)

Comments on Table 2.

Details of varieties sown and dates of sowing were—

Trial 1: Tuscan sown 28th June, 1934.

Trial 2: Tuscan sown 14th July, 1934.

Trial 3: Tuscan sown 2nd August, 1934.

Trial 4: Jumbuck sown 5th September, 1934.

Trial 5: Hunters sown 11th May, 1934.

Trial 6: Tuscan sown 24th May, 1934.

In two of the experiments each increase in seeding was accompanied by increased yields. The results of trials 3 and 6 appear anomalous, especially the former, in which the 120 lb. sowing gives a depression below that of 90 lb., whereas by further increasing the seeding a significant increase is recorded.

In experiment 5 a significant depression in yield resulted from increasing the seeding from 120 lb. to 150 lb. The results of experiment 4 are interesting, as this trial was spring sown, and the only real increase is the substantial one of 4·7 bushels from the 150 lb. seeding. This lends support to the practice of sowing an increased quantity of seed in the spring.

Examination of Grain Samples.

Samples of grain from each experiment in the 1934–35 season were sent to Mr. McKay for grading. As in previous years, it was reported that differences were negligible. There were slight variations in bushel weight, and it was mainly on this factor that any decision could be arrived at in classifying the samples.

Actually the widest range in bushel weight was in trial 1, in which there was a difference of 2 lb. to the bushel between the 60 lb. and 150 lb. sowings, but the difference was in favour of the heavier sowing. As in trials in the previous year and those reported on by Hudson and Stafford, the results of the judging show that the differences in value were insignificant.

Conclusion.

Summarizing the results (excluding trial 4 in the 1934–35 season, which was spring sown), the average increase over the two seasons has been as follows:—

> The 90 lb. seedings have yielded on the average 1¾ bushels per acre more than the 60 lb. seedings. The 120 lb. seedings have yielded 1⅛ bushels more than the 90 lb. seedings.

It would appear, therefore, that, apart from special circumstances, such as on heavy land where lodging is likely to occur, there appears to be no reason for a reduction of seeding below 90 lb. There is, in fact, enough evidence to encourage seedings to be increased to 120 lb.

The series of trials reported by Hudson and Stafford and those outlined herein indicate quite clearly that there is nothing to be gained by a reduction of seed below 120 lb. on the score of "sample"—*i.e.*, the attractiveness of the grain.

Acknowledgments.

Thanks are extended to Messrs. J. Ireland and J. G. McKay for judging the grain samples and to those farmers who co-operated in the above trials. The field-work described was carried out by Messrs. W. Stafford, E. M. Bates, T. A. Sellwood, G. G. Calder, and H. de O. Chamberlain, of the instructional staff of the Fields Division. The trials were planned in the first instance by Mr. A. W. Hudson, late Crop Experimentalist of the Department of Agriculture.

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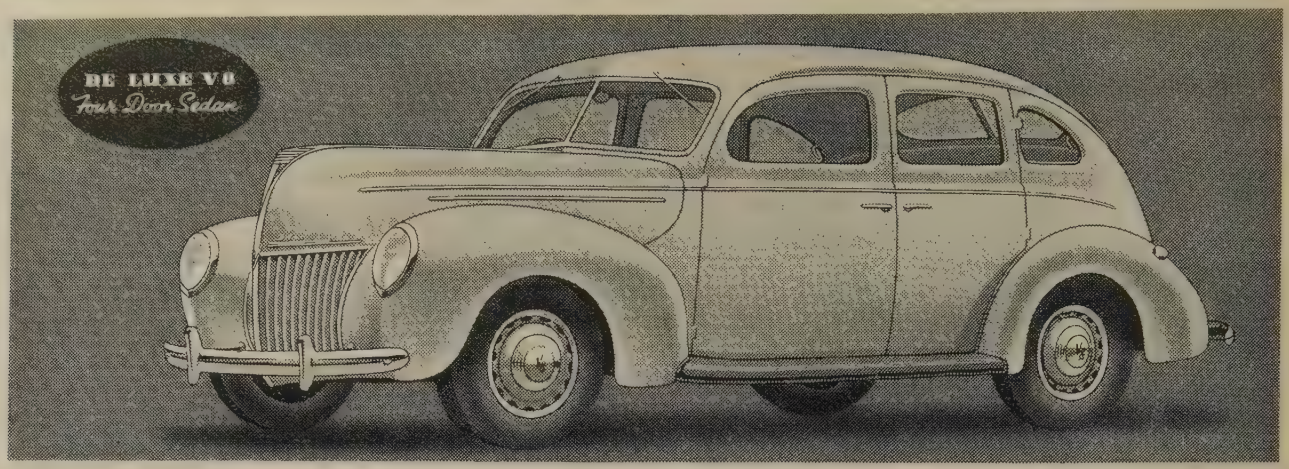

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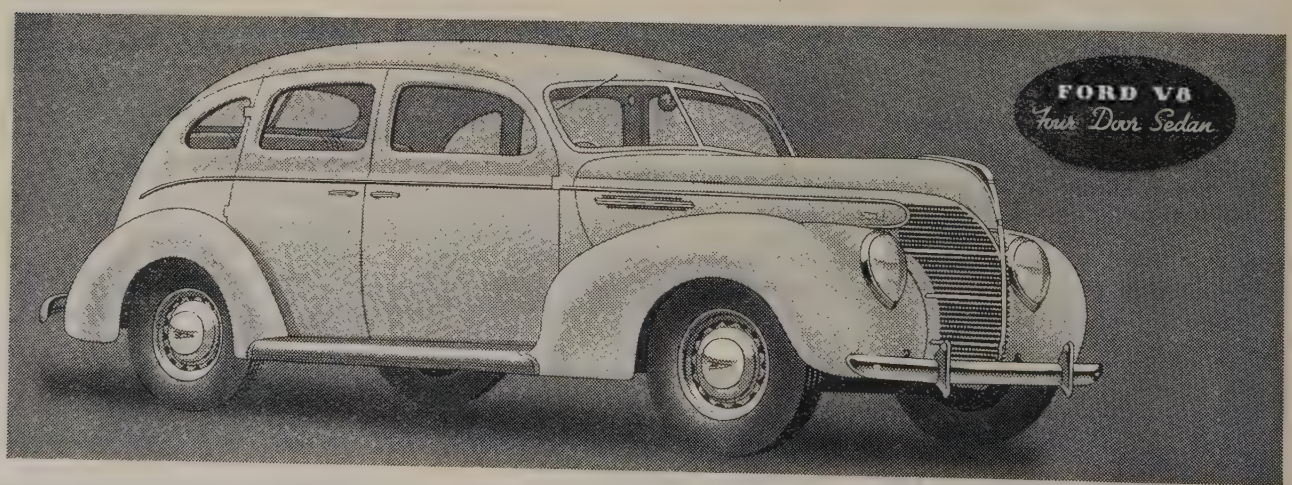

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Early Spring Top-dressing Justified.

Trials at Ruakura Farm of Instruction.

E. R. MARRYATT, Fields Instructor, Ruakura Farm.

EXCEPT for special purposes on individual fields—*e.g.*, before or after a silage or hay crop—top-dressing on dairy-farms extends from the late summer to the early spring. This is largely due to the convenience of time to do the work and not because it does not matter when top-dressing is done, for it does matter.

There are several considerations other than convenience. The first, and perhaps most important, is that except for direct application of nitrogenous fertilizers top-dressing is usually done to make clover grow. Superphosphate and potash are to some extent usable by clover immediately they become dissolved in soil moisture. The longer they are left unused in the soil the greater becomes the danger of more and more of them becoming " fixed " in a form unavailable to plants. Their effects, then, become increasingly lost.

Absorption of Potash.

Some soils are known to absorb potash so strongly that practically nothing is usable by the plant, as is the case in Denmark. Phosphate fixation may also nullify the desired results. In order that the most may be obtained from expenditure on phosphates and potash it is imperative, therefore, that top-dressing should be done while the clover is growing and while there is yet probable a fairly long period of active growth. This means either late summer or early autumn top-dressing or else spring top-dressing.

In a normal spring, however, clover grows luxuriantly without top-dressing at that time, and it is therefore doubtful whether added fertilizer in the spring is always efficiently used. Further, one of the main aims of grassland management is to smooth out the unevenness of pasture-production throughout the year. Usually, spring top-dressing merely intensifies the natural differences in seasonal growth. In many districts enough trouble is caused by the natural flush of white clover causing feed-flavour and bloat without accentuating it.

> Although the early autumn is an admirable time to top-dress with phosphates it is not unwise to top-dress one or two fields in August or September when the clover begins to move away, if this is done merely as an insurance against a late spring. An experience at Ruakura Farm shows the value of this policy.

Wisest Procedure.

Late summer and autumn top-dressing is, as a general rule, wisest, because, although in the long run total pasture-production may not be greatly affected whether the top-dressing be done in the autumn or in the spring, the time of top-dressing greatly affects distribution of pasture-production.

" Manures should always be applied when the root systems are active and when they are not restricted. Do not, therefore, apply manures " in the winter or " very early in the spring, or when pastures are being grazed to excess."—*(Aberystwyth publication, 1933.)*

Although spring top-dressing with phosphates should normally be restricted to hay and silage fields it is not unwise to top-dress one or two other pastures in August or September when the clover begins to move away, provided it is done simply as an insurance against a late spring. An experience this year in the Ruakura grazing trials shows the value of this policy.

The average rainfall for October at Ruakura is about 4½ in., but the total for October, 1938, was little more than 1 in. Many nights were cold ; in fact, twelve frosts were recorded. Dry soil and cold nights severely restricted pasture-growth.

Fig. 1.—No extra phosphate in the spring. No flush in a late spring but, instead, profuse flowering of white clover.

[E. R. Marryatt, photo.

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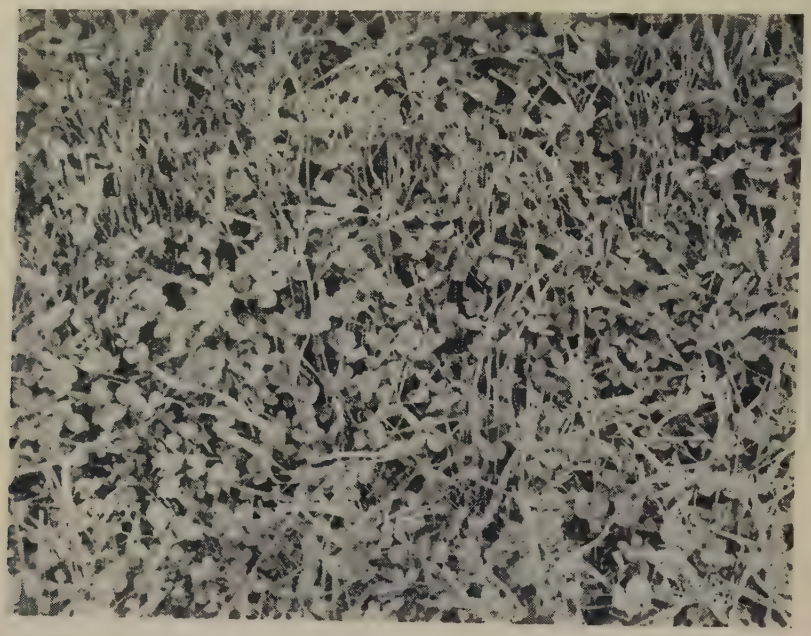

Fig. 2.—Extra phosphate in the spring. Active growth maintained in a late spring and only odd flowers of white clover.

[E. R. Marryatt, photo.

In the winter-grazed pasture which received no extra top-dressing in the spring the white clover produced no flush of leafage and flowered profusely at the end of October (Fig. 1), when, in a normal year, it should be producing or beginning to produce its flush of leafage.

On the other hand, in the winter-grazed pasture which received extra superphosphate and lime on the 18th August, there was no general flowering, although there were a few scattered flower-heads of white clover, and the active growth of white clover, while not rapid, was much better (Fig. 2) than in the other field. Further, there is a difference in soil-type between these fields which should favour the one not top-dressed in the spring (Te Kowhai series), tending to retard flowering and maintain normal active growth in a dry period. The field which was top-dressed in the spring is in the Horotiu series, and these soils dry out more quickly than do the Te Kowhai soils, tending to promote flowering.

Both fields received superphosphate at 3 cwt., potash at 1 cwt., and lime at 3 cwt. in the early autumn.

Which is the Best Baconer?

Carcass Quality Scheme For Bacon Pigs.

Contributed by the LIVE-STOCK DIVISION.

THE question "Which is the best baconer?" is asked whenever more than half a dozen farmers begin to discuss the merits of their pigs. Every time a lecture is given on pigs the same teaser is put up. No one can give an answer to it or advocate any one breed or cross in the absence of reliable information to support the claim.

In 1937 the Department of Agriculture, working in conjunction with the National Pig Industry Council, made a first attempt to obtain some information on the point, and a report was published in the *Journal* for July, 1938. The attempt was not satisfactory, chiefly for the reason that the pigs were tattooed at the works, where their breeding had to be decided by eye inspection. This was unsatisfactory, firstly, because no one can be sure of the origin of the majority of pigs just from their appearance, and, secondly, because this procedure gave no information about the age of the pigs.

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"Which is the best baconer?" The answer to this question can be found by pig-farmers supporting the scheme introduced last year by which pigs are tattooed on the owner's farm, reported on by the work's grader, and the report returned to the farmer through the Department. Get in touch with the District Council Supervisor in your area, and he will do the work at no cost to you.

Legible Tattoos.

In October, 1938, the tattooing was undertaken by the Supervisors of the District Pig Councils. They were able to do this work on the owner's farm, and at the same time ascertain the age and breeding of the pigs. As in all new ventures, there has been a number of pitfalls, and of these the one that has most to be guarded against is the possibility of the tattoo not being legible by the works grader.

There are quite a number of farms on which all the pigs tattooed have been accounted for, others where only a certain number have come through the works, and still others where no tattooed pigs have been sent in. At present it is impossible to say on how many pigs the tattoo has failed, as many of the tattooed pigs may not yet be killed. Reports from District Council Supervisors indicate that approximately 80 per cent. of the tattoos are legible. This is most satisfactory, and it seems reasonable to suppose that the other 20 per cent. can be tattooed equally satisfactorily with the increase in experience.

The tattooed pigs are reported on by the works graders, and the thanks of the industry are due to the trade for the interest they have shown in this work and the efficiency with which their returns are rendered.

The graders' returns are sent to the Department of Agriculture once a month. Each owner then receives a copy of the grading and growth rate. This can be expected, as a rule, by the end of the following month, as graders' returns are not finally received until about the middle of the month, and the posting of the details takes time.

Success of Process.

As originally stated, the success of this process depends on large numbers of pigs being tattooed, because information about any class or breed of pigs becomes reliable only when it is based on hundreds of that particular kind. Although there are only four principal breeds used in New Zealand, distinctions have to be made between pedigree animals and non-pedigree animals. Hence there are at least eight kinds of boar used—viz., pedigree Tamworths, Berkshires, Large Whites, and Large Blacks, and non-pedigree animals of these breeds. At least five hundred pigs from sires of each of these breeds are required for the purpose of comparing one with the other.

With sows there are fifteen different classes—four pedigree, four non-pedigree, six first cross, and grade sows, grades being defined as animals of mixed blood more removed than first cross (*e.g.*, T. x B.T.). This means that the possible breeds of pigs that may be obtained from eight kinds of boar and fifteen kinds of sow are 120.

Unregistered boars will seldom be used on pedigree sows of another breed, and in this way twelve of the possible crosses are eliminated, but this reduction in varieties is offset by the wide range of variety that is produced by grade sows with all classes of boars.

Readers could with advantage ponder over where the industry is heading for with so many classes of pig, even if every one of these was excellent. Visible differences in an article that is supposed to be standard create doubts in the minds of buyers. Doubts in the minds of English buyers must be paid for by New Zealand producers.

Finding the Answer.

Those who are anxious to know which is the best breed of baconer can find an answer only by having their own baconers

tattooed and encouraging their neighbours to do the same. A note to the Supervisor of the District Council in the area is the first move in this direction. Beyond giving the Supervisor a little help in doing the job, there is no further obligation on the owner.

As only baconers are measured when graded, pigs intended for bacon only are tattooed, and these may be done any time from porker weight until just prior to slaughter. The service costs the farmer nothing.

For the purpose of demonstrating the possibilities of the scheme the following progress report is provided. In the following table the pigs are grouped by breed of boar only, but if there were sufficient numbers they could be grouped by breed of sow, month of birth, and numerous other ways that would supply useful information.

Table Showing Attributes of Pigs Sired by Different Breeds of Boar.

—	Breed.					
	Tamworth.		Large Whites.		Berkshires, both Classes	Large Black, both Classes.
	Registered	Unregistered	Registered	Unregistered		
Number of pigs	94	69	32	15	27	46
Averages of—						
Age at slaughter (days)	226	232	207	224	264	251
Weight (lb.)	142·5	141·2	137	134	144	135
Growth-rate per day	0·63	0·61	0·66	0·60	0·55	0·54
*Thickness of back-fat	13·0	12·9	13·3	11·6	12·4	13·1
*Thickness of loin	8·3	8·4	8·0	7·7	7·9	8·3
Length of side	29·8	29·0	28·2	..	..	..
Grading percentages—						
Prime 1	74	77	66	..	84	72
Prime 2	15	22	31	..	8	26
Prime 3	8	..	..	..	8	..
Second quality	3	1	3	..	..	2

*Thickness of back-fat and loin fat are measured in eighths of an inch.

Standard Adopted.

The figures in the table for growth-rate, length, and back-fat require to be tagged to a standard, and those adopted by the Bacon Development Board, London, for pigs of these weights are as follows (maximum and [average]. values are quoted) :—

Carcass-weights :

130 lb. to 139 lb.—
- Growth rate .. 0·75 (0·60) lb. per day ;
- Length .. 33·2 (29·2) inches ;
- Shoulder fat .. 12½ (16) eighths ;
- Loin .. 7½ (6) (9) eighths.

140 lb. to 149 lb.—
- Growth rate .. 0·75 (0·60) lb. ;
- Length .. 33·6 (29·6) inches ;
- Shoulder fat .. 13 (16) eighths ;
- Loin .. 8 (6½) (9½) eighths.

Two average values are given for loin, as excessive fat is just as objectionable as too little.

Various readers may feel inclined to arrive at many different conclusions, and rate of growth length, or grading may interest them. As pointed out previously, the number of pigs listed is insufficient to enable reliable conclusions to be drawn.

✣ ✣ ✣

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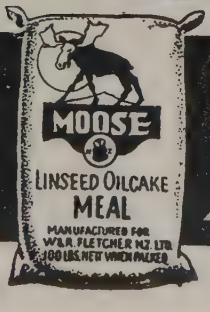

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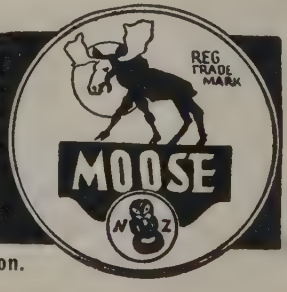

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Nectar Secretion and Pollen Supply.

Influences of Climate, Soil, and Flora.

H. F. DODSON, Apiary Instructor, Palmerston North.

THE future of the honey industry—its advancement and stabilization—depends largely upon the solution of certain problems relating to nectar secretion. One of the chief obstacles to successful organization in the commercial apiary is an almost complete ignorance of the precise factors which govern a honey-flow, resulting in an inability to predict—let alone influence or improve—its commencement, duration, its quantity or quality.

McLachen suggests, in his series of articles "The Mystery of Nectar," that, although nectar is supposed to attract insects to bring about cross-pollination, the existence of extra floral nectaries (such as are found on the leaf-stalks of various plants) shows that nectar secretion is not entirely bound up with plant reproduction, but may be influenced by extraneous factors of which beekeepers and others at present know little or nothing.

The nectar secretion in a number of plants which are the basis of the honey industry shows unpredictable variations, and this article summarizes the investigations into this problem which have been made to date. It is suggested that beekeepers can assist in the researches which are being carried out by providing information from their own experiences, and a chart for recording their observations has been drawn up for this purpose.

Plants Variable.

Honey plants are extremely variable in their preferences for different soils, and the secretion of nectar is often, if not always, correlated with the character of the soil, atmospheric temperatures, and water-supply. Even where there is good honey flora, fine weather is essential if the bees are to bring the nectar into the hive. Flowers begin to bloom at much the same time each year, but adverse weather may greatly retard the honey-flow.

A healthy plant will secrete more and better nectar than a sickly, ill-nourished one. Consequently, the amount of nectar available depends partly on the fertility of the soil. The importance of correct top-dressing by farmers will thus be seen to have a wider significance than is perhaps at first realized by beekeepers. Certain plants yield nectar in any noticeable quantity only in certain soils—no doubt because it is only in these soils that the particular species of plant is properly nourished.

Again, it is frequently observed that certain pastures, given similar weather and similar farm management, will vary widely and inexplicably from season to season in the amount of nectar derived from them. No other explanation but variations in soil conditions can at present be suggested.

White clover, which is easily the most important honey-plant in New Zealand, yields not only a large proportion of the main crop, but also a nectar from which is derived a honey of the finest natural qualities of colour and flavour. Yet pastures, formerly yielding clover in abundance may later produce it only sparingly, or not at all. Phosphate top-dressing plays a tremendous part in white-clover production.

Effect of Weather.

The weather during the actual growth of the plant may also considerably affect its nectar productivity months later. Unsatisfactory weather, some weeks or even months before the expected flow, may seriously diminish the beekeeper's profits. These factors possibly account for Manley's findings that temperature is the most important single condition governing a honey-flow. Indeed, published results of experiments undertaken at the McDonald College, Quebec, indicate that the honey-flow is influenced to a large extent by conditions prevailing not only in the previous winter, but even during the previous year.

The beekeeper's biggest problem is not so much consistently bad seasons, as seasons consistently unpredictable, rendering his preparations highly speculative. While it must be recognized that the honey-flow is dependent primarily on the weather, there are other important factors which need to be more fully understood.

A more complete knowledge of these factors would be of inestimable value to the commercial apiarist in determining his policy for the season ahead. The apiarist, with a chain of outyards embracing a large district, who could calculate with a certain degree of accuracy the dates and quality of his honey-flow in the localities where his yards were situated would be in a far happier position than he is to-day.

As a preliminary to the investigation of the vagaries of the honey-flow it would be advisable, first of all, to survey the floral sources of the flow. In order to simplify the matter three localities may be selected, from a comparison of which some conclusions in regard to the influence and inter-relations of climate, soil, and flora may be drawn.

Concrete Examples.

The areas selected—Sanson, Kairanga, and Pohangina—may be regarded as representative types of country, though there is, of course, an infinite variety of areas throughout New Zealand having totally different conditions from these particular examples.

The tables following indicate the floral sources, and certain relative data, found in the areas under consideration. In New Zealand as a whole floral sources are not ordinarily found in sharply defined areas, although there are isolated localities to which certain plants and shrubs are peculiar.

Speaking generally, the main nectar-producing flora, especially white clover, may be said to exist throughout the country as a whole. However, in different localities the combinations and proportions of the nectar sources vary considerably.

Table 1.

Locality : Bulls, Sanson, and Rongotea.
Area : 64 square miles (7·2 colonies per square mile).
Type of Country : Mostly dairying, fair proportion of sheep. Broken by scrub gullies, patches of bush, soil easily dries, well watered by rivers. Poor shelter.
Crop Results : 1936–37 season, 112 lb. per colony; 1937–38 season, 80 lb. per colony.

Month.	Source.	Yield.	Colour.	Flavour.
August	Gorse	Pollen	..	..
September	Native bush	Mixture and pollen	L.A.	Mild.
October (early)	Straight willow	Nectar	E.L.A.	Medium.
October (late)	Basket willow	Nectar	E.L.A.	Medium.
November	Buttercup	Nectar	L.A.	Pronounced.
November	Lupin	Pollen	..	..
November	Cabbage-trees	Nectar	L.A.	Pronounced.
December	White clover	Nectar	White	Delicate.
January	White clover	Nectar	White	Delicate.
January	Capeweed, &c.	Nectar	L.A.	Medium.
February	Thistle	Nectar	White	Delicate.

Abbreviations : L.A., light amber; E.L.A., extra light amber.

Table 2.

Locality : Pohangina.
Area : 36 square miles (6·5 colonies per square mile).
Type of Country : Undulating, heavy clay; mainly sheep; dairying on flats; broken, hilly country and bush areas towards ranges. Average shelter.
Crop Results : 1936–37 season, 35 lb. per colony; 1937–38 season, 75 lb. per colony.

Month.	Source.	Yield.	Colour.	Flavour.
August	Tree lucerne	Nectar	E.L.A.	Mild.
September	Weeping willow	Nectar	E.L.A.	Medium.
October	Straight willow	Nectar	E.L.A.	Mild.
November	Bush sources	Nectar	L.A.	Pronounced.
	Manuka	No flow in this district	..	..
December	Clover	Nectar	White	Delicate.
	Buttercup and lupin	None in this district	..	..
	Kamahi	Nectar	E.L.A.	Objectionable.
January	Capeweed	Nectar	L.A.	Medium.
	Pennyroyal	Nectar	L.A.	Pronounced.
February	Thistle	Nectar	White	Delicate.

Table 3.

Locality : Kairanga.
Area : 16 square miles (12·5 colonies per square mile).
Type of Country : Mixed sheep and dairy land. Flats; high carrying-capacity. Shelter very poor.
Crop Results : 1936–37 season, 12 lb. per colony; 1937–38 season, 125 lb. per colony.

Month.	Source.	Yield.	Colour.	Flavour.
August	*Pinus insignus*	Pollen	..	..
September	..	Nothing	..	..
October (early)	Straight willow	Nectar	E.L.A.	Medium.
October (late)	Basket willow	Nectar	E.L.A.	Medium.
November	..	Nothing	..	..
December and January	Clover	Nectar	White	Delicate.
February	Thistle	Nectar	White	Delicate.

An examination of these tables will reveal a discrepancy in crop results in 1936–37 as compared with the 1937–38 season—not entirely accounted for by what is loosely referred to as "the bad season."

Wide Variations.

For instance, it will be observed that whereas in the Kairanga district the annual average crop jumped from 12 lb. per colony in the 1936–37 season to 125 lb. in the 1937–38 season, the Sanson district, which is adjacent, returned 112 lb. per colony average in the 1936–37 season and only 80 lb. per colony in 1937–38—a complete reversal. Pohangina in 1937–38 produced more than double the crop of 1936–37 with a hive population very little lower than Sanson and half that of Kairanga.

Beutler has shown that moisture in the soil affects the quality of the nectar very little. The soil must, of course, be moist enough to allow the plant to carry out its chemical processes. But given this, the factor that influences nectar the most is, she finds, moisture in the air. Just after rain there is much more nectar—even in flowers that protect their nectar by spurs and the like—but this nectar is very watery not only because it contains more water absorbed from the air, but also because at such times each flower tends to contain less sugar in its nectar.

Habits of Bee.

According to Minderhoud, every bee has its own pitch (a comparatively small portion of country) in which it works, returning to it continually. Should nectar run short it is by no means certain that the bee will wander farther afield. Probably it merely wastes time in its own pitch, hunting unsuccessfully for nectar, eventually returning to the hive to become a nuisance to its neighbours and the apiarist. For this reason, therefore, it would appear that nectar itself must be plentiful and the contributing plants concentrated for a really good flow. Differences in these two important factors are possibly concerned with the remarkable differences in returns from adjacent localities.

Although no single factor of climate can be considered apart from the others, it appears that after a certain temperature is reached the composition and intensity of light have a more profound influence on flight than temperature. Brittain shows, as a result of experiments undertaken, that optimum temperature conditions do not always synchronize with optimum light conditions and that the latter have the greater influence on bee flight. In normal circumstances, he finds, optimum temperature conditions

occur later in the day than do optimum light conditions, hence morning counts of bees in flight were regularly higher than afternoon counts for a given temperature, because of the higher light values existing in the morning hours.

Light values—especially ultra violet—diminish rapidly in the afternoon, though the temperature may be stationary or even rising, and with them the bee counts gradually fall. This may well account for inactivity sometimes observed in hives during the heat of the afternoon when nectar might be expected to be yielding heavily and the bees working at high pressure.

Days of Heaviest Flow.

Manley finds, as a result of experiments, that some of the days of heaviest flow were not sunny days, but, generally speaking, sun and high temperatures constitute ideal weather for nectar-secretion. For best results there cannot be any doubt that a temperature of 80° F. is needed, and night temperatures do not appear to have so much effect as is often thought. In making his observations, Manley kept his records by graph, and when the temperature graphs were examined it was found that the heaviest flows actually occurred when the two lines representing the maximum day and night temperatures respectively were farthest apart. From this it may be reasonably concluded that the less difference there is between day and night temperatures the less honey will there be. The idea that hot nights are desirable, if not necessary, is thus not borne out.

It may be fairly conceded that, although many interesting facts are continually being discovered, a considerable distance has yet to be traversed before these results can materially enhance the bee-keeper's knowledge of the season ahead. It is only by patient investigation and systematic recording of observed facts that results of value will ultimately be achieved.

Suggested Seasonal Chart.

Twenty-five Colonies. Smith's Yard.	CROP RECORD.	1937–38 season.
District : Fitzherbert. *Area covered :* 8 square miles. *Type of country :* Dairying ; some sheep ; bush areas ; hilly ; scrub gullies.	*August :* Wind, south-west ; cold showers. *September :* Mild, warm wind ; showery. *October :* Warm periods, cold nights. *November :* Warm ; showery ; some wind. *December :* Fair weather ; light showers. *January :* Hot, dry ; no wind. *February :* Slight showers ; hot nights. *March :* Cooler nights ; rain ; some wind ; very warm.	

Month.	Floral Source.	Amount of Flow per Colony.	
November	Straight willow	15 lb.	
December	Clover, catsear	40 lb.	
January	Clover, catsear	30 lb.	
February	Clover, thistle	20 lb.	
March	Mixed sources	12 lb.	117 lb. surplus.

Remarks : Apiary requeened 31st March, 1938.

Records Suggested.

It is suggested that over a period of several years beekeepers might record essential facts regarding their districts, their seasons, and their crops.

For this purpose a seasonal chart is illustrated which may serve as a guide for those who wish to adopt such a method of recording. By means of accurate and systematic analysis of seasonal factors the beekeeper will have before him at the conclusion of a cycle of seasons a complete range of relevant facts, each one of which will have contributed, in some measure, to the success or failure of the season.

This crop-record card is capable of expansion and development according to the ingenuity and requirements of the beekeeper, but it should aim at simplicity and the recording of essential facts only.

With this information available, recognizable symptoms will begin to emerge prior to the season. Such records, faithfully kept, would also provide a sound basis upon which to begin the necessary research work into the whole question of crop failures.

The Effects of Non-cultivation.

UNDER the average dry seasonal conditions in Hawke's Bay occurring in spring and early summer, non-cultivation or failure to secure a good tilth early in the season in bearing orchards is immediately reflected in the poor tone of foliage. Growth is retarded and foliage will not withstand the usual spray mixtures applied in summer. Apple foliage will readily scorch, thus leading to complications in disease-control, as it appears to be fatal to continue using lime-sulphur under such conditions. Peaches, too, readily defoliate if sprayed with sulphur spray. I have observed well-established pear-trees growing on non-cultivated land of a very deep rich type where the effect on foliage was not so apparent, but the general effect was smaller fruit and reduced yield.

I have under observation a block of eight-year-old Cox's Orange sown down in Italian rye last autumn in order to steady down growth and bring the block into cropping. These trees are still growing strongly and are carrying a medium crop, and foliage is of good tone. From petal-fall no lime-sulphur has been used, but Ialine colloidal sulphur has been used as a fungicide. In such a case non-cultivation may prove a useful expedient in checking rank growth, but normally early cultivation is, without doubt, very essential in this district.

—N. J. Adamson, Orchard Instructor, Hastings.

A farmer in the Bay of Plenty has had good success from the use of the electric fence. He has the greater portion of his farm fenced in this way and has had no difficulty in keeping his stock in the correct fields. He has two wires, one 18 in. from the ground and one 3 ft.

K. P.

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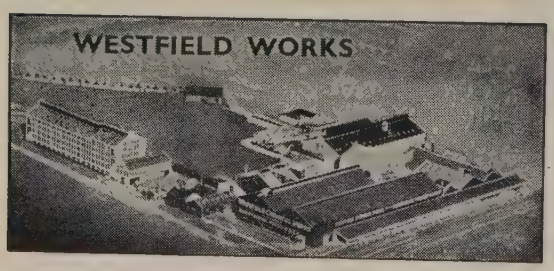

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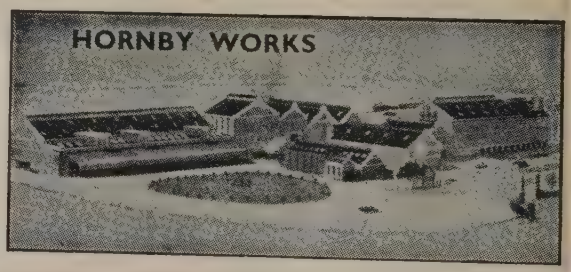

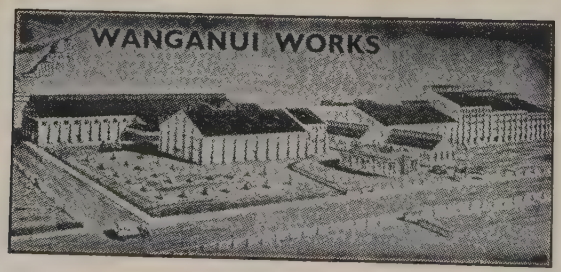

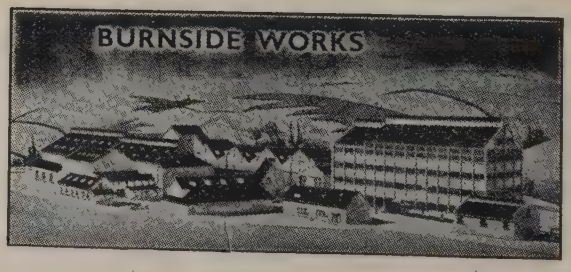

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Changing Sour Soil into Sweet.——

Fig. 1.—Some of the two hundred wethers grazing on the feed.

Outstanding Southland Farm Illustrates Value of Liming.

W. L. HARBORD, Instructor in Agriculture, Invercargill.

IT is well known that Southland, as a whole, is a province which responds readily and with satisfactory results to applications of lime to the soil. Southland uses more lime for agricultural purposes than any other province in this Dominion, and at the same time produces a lime from her own territories which compares more than favourably in quality with that produced in other provinces.

Nevertheless, this does not mean that the Southland farmer is making as much use of lime as he could. There are many farmers who do realize the full extent to which lime can be applied to their farms and do apply it to the soil in the required quantities, but at the same time this is not the case with the majority. The application of lime and manures is, in some cases, very haphazard, and shows that very little concentrated thought is given to the matter which, to put it mildly, is a sad state of affairs.

New Zealand, and particularly the Southland Province, is largely dependent on the overseas fat-lamb market as a source of revenue. Each year sees this lamb market becoming more exacting in its demands, and the farmer has to be ever on the alert to see that his pastures are up to the desired standard. Without good pastures the lambs will not fatten in the shortest possible time.

> While a farmer may exercise great care in the quality, quantity, and different types of grasses and clovers he sows, he must attach equal importance to the sourness or sweetness of the soil. An outstanding Southland farm which was raised from a poor state to one of good production demonstrates the value of proper liming.

Some farmers exercise great care in the quality, quantity, and different types of grasses and clovers they sow, but this is not all that should be considered. A first-class seed-mixture may be sown and a reasonably good-looking pasture may result, but still the lambs may not fatten. "What is wrong with the paddock?" the farmer asks himself. Does he ever consider the state of the soil as a means of affecting the fattening of his stock?

Soil Conditions Vary.

Soil conditions can, and do, vary considerably in different paddocks of farms. In paddock A a soil sample test may show an acidity, or pH, of 4·8, while in an adjoining paddock the state of acidity or sourness may be slight, the pH showing about 6·8 or better. It has been found, as a whole, that where there is excess acidity, stock-fattening is not as successful or quick as would be desired. Where the soil is showing an inclination to sweetness (*i.e.*, a pH of 7·0) the pasture is of the best-feeding quality and fattening is efficient.

The question is how to rectify this sourness. A farmer may say that he applied 1 ton of lime per acre only last year and that his paddock still shows an acidity of pH 5·8 or less. This may be quite true, but it must be remembered that when the pH is as low as 4·8 or even 5·0 the first ton of lime per acre applied sweetens the soil by only a few decimal

points and perhaps shifts the pH reading from 4·8 up to only 5·2 or 5·4. Soil-sweetening cannot be carried out completely in one year. It takes several years, depending on the extent of the actual soil acidity.

With this in view the farmer should make provision to have his paddocks tested for calcium requirement, and should set to work immediately to rectify any faults in his top-dressing. A sound policy is the application of up to 30 cwt. of carbonate of lime per acre, to be applied on the area under cultivation, this to be followed up each year with lesser quantities so that the soil is gradually brought to a sweet state.

Outstanding Farm.

An interesting piece of farm improvement work has been carried out by Mr. G. W. Keir, of Isla Bank, Southland. Mr. Keir took over his farm a little over four years ago, and he did so against the advice of other farmers, who told him the place was one of poor ability to produce. Certainly it appeared to be in a bad state, and during the first year some paddocks were barely able to keep one sheep per acre alive. The pastures were definitely very poor, and consisted almost solely of browntop.

Fig. 2.—The type of growth on the 25-acre paddock. Note the strong growth of white clover.

Fig. 3.—Some of the haystacks already built in the 53-acre paddock. These stacks are estimated to hold approximately 6 tons of hay each.

To-day the farm can be considered among the good farms of the district, and it is solely due to Mr. Keir's sound policy of top-dressing and liming. Two paddocks in particular are worthy of note. The first is of 25 acres, which was ploughed up and had a crop of turnips sown on it during the latter months of 1936. At this stage 10 cwt. of carbonate of lime was broadcast on the paddock as a pre-sowing. The following year it was ploughed again and a further 1 ton of carbonate of lime per acre applied before it was sown down to pasture with a crop of oats. The oats were sown with 2½ cwt. of superphosphate; even in that bad year a 60-bushel-per-acre crop was cut.

During last autumn a further 3 cwt. per acre of superphosphate was applied. Towards the end of September, 1938, 200 ewes with lambs were put on the paddock. At shearing-time, which was about the beginning of January, these were taken off and replaced immediately with more than two hundred wethers. To-day the wethers are all fat, and there is every reason to believe that there is still two months' feed for this large flock.

The seed-mixture sown in this paddock consisted of 2½ bushels of perennial rye-grass, 7 lb. of cocksfoot, 1½ lb. of white clover, 1½ lb. of alsike, and 3 lb. of red clover. To-day the pasture shows an abundance of perennial rye-grass,

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white clover, dogstail, cocksfoot, and alsike, with volunteer suckling clover and a trace of Yorkshire fog. This is a splendid example of what liming and manuring can produce from what at one time was apparently a poor farm.

Pre-dressings of Lime.

In the other paddock, which consists of 53 acres, Mr. Keir is cutting a crop of hay which he expects to yield 1½ tons of hay per acre. In September, 1935, half of the paddock was sown with oats, and in December of the same year the other half was sown with turnips and rape. All received a pre-dressing of 1 ton of carbonate of lime per acre. In 1936 the paddock was sown out to grass with a 50 : 50 mixture of reverted superphosphate and Seychelles guano at 4 cwt. per acre. The seed-mixture sown was the same as in the other paddock mentioned, with the addition of 5 lb. dogstail.

Since being sown this paddock has received a further 10 cwt. per acre of carbonate of lime, which has been applied in two 5 cwt. per acre dressings, and last year 3 cwt. of superphosphate per acre was applied during the autumn. In this paddock the grasses and clovers are the same as in the other paddock, and there is a small quantity of *Lotus*

Fig. 4.—A view of the crop to be cut for hay. A large percentage of the flower-head showing is of alsike.

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major showing. During the first year the pasture produced a tremendous quantity of feed and Mr. Keir had stock from neighbouring farmers on the paddock to keep the grass down. So far six stacks of hay have been built, and the hay is of a splendid quality.

There is no doubt that without the careful treatment and the application of these heavy initial quantities of lime, which will be followed up each year with lesser quantities, the paddocks concerned would not have produced as they have.

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Production of Good Litters.

Feeding Experiments with Young Pigs.

C. E. BALLINGER, Assistant Experimentalist, Ruakura Farm.

THE production of good litters which average 40 lb. or better at eight weeks is one of the best indications of good pig-management. Heavy weaners point to good management of the sow and litter before and after farrowing, but, unfortunately, many of those who realize the value of good management of the sow do not reap the fullest benefit of their labour by making the most of the advantage of creep-feeding the litter.

There are, of course, a number of factors other than feeding which influence litter-production. The sow must have good mothering and milking qualities, and the young pigs must be of good weight at birth and of sound constitution. These factors, however, are fundamental, and are influenced only indirectly—*i.e.*, by sound breeding and selection. Nevertheless, good breeding alone is insufficient for good litter-production. It is the feeding and management of the litter from about three weeks of age onward which is so essential.

> Good breeding alone is insufficient for good litter-production. It is the feeding and management of the litter from about three weeks of age onward which is so essential.

Supplementary Feed.

At about three weeks of age the food requirements of a litter of well-grown pigs outgrows the milk-production of the mother, and they begin to look for supplementary feed. The time at which young pigs will commence creep-feeding, however, depends more on their size and the milk-production of the sow than on their age. Pigs averaging 3 lb. to 4 lb. at birth will be looking for food around the mother's trough when they are about two weeks old. A litter which averages 1½ lb. to 2 lb. at birth will not look for food until they are, perhaps, four to five weeks old.

Unfortunately, the mother's trough is often the only source of feed to which the young pigs have access, and this will be empty except for a few minutes when the sow is fed. The stomach capacity of suckling pigs is very small, and they need access to food at all times—a little and often, and of the best quality.

Trials at Ruakura Farm.

From trials carried out at Ruakura Experimental Farm it appears that numerous feeds can be fed to young pigs with success, and good weaning weights of 40 lb. or better obtained. Skim-milk alone, skim-milk and a small quantity of whole milk, and skim-milk and curd all gave excellent results.

Meal was also used in conjunction with skim-milk, and meat-meal and a meat-meal - pollard mixture gave results similar to that obtained with the previously mentioned skim-milk, &c. The litters were creep-fed, and had access at all times to the skim-milk and the experimental ration fed with it.

One point observed throughout the trials was the importance of and the amount of skim-milk consumed by the litters. Whatever the experimental ration offered, the young pigs consumed approximately two-thirds of the total feed as skim-milk. This may be seen from the feed consumption given in the following table, and by assuming that the equivalent value of 1 gallon of skim-milk equals one pound of meal.

The curds were skimmed from a barrel of soured skim-milk and allowed to drain for a few hours.

Importance of Skim-milk.

This table emphasizes the importance of providing skim-milk at all times and irrespective of the supplementary rations fed with it. The milk should be sweet, and should be changed daily at the commencement of feeding. The sourness of milk a day old does not harm the little pigs when they are feeding well at five or six weeks of age, but sweet milk to begin with encourages them to drink.

Much of the scouring in sucking-pigs ascribed to sour milk is due to the trough being empty for several hours, the little pigs afterwards being allowed to gorge their fill. Another common cause of

Experimental Rations.	Food Consumption per Piglet.		Average Weaning Weight.
	Skim-milk.	Meal, &c.	
	Gallons.	lb.	lb.
Skim-milk	32·5	..	41·9
Skim-milk and meat-meal	21·5	12·8	42·0
Skim-milk, meat-meal, and pollard	17·2	12·0	44·3
		Gallons.	
Skim-milk and whole milk	21·5	4·0	40·7
Skim-milk and curds	24·6	54·5	42·6

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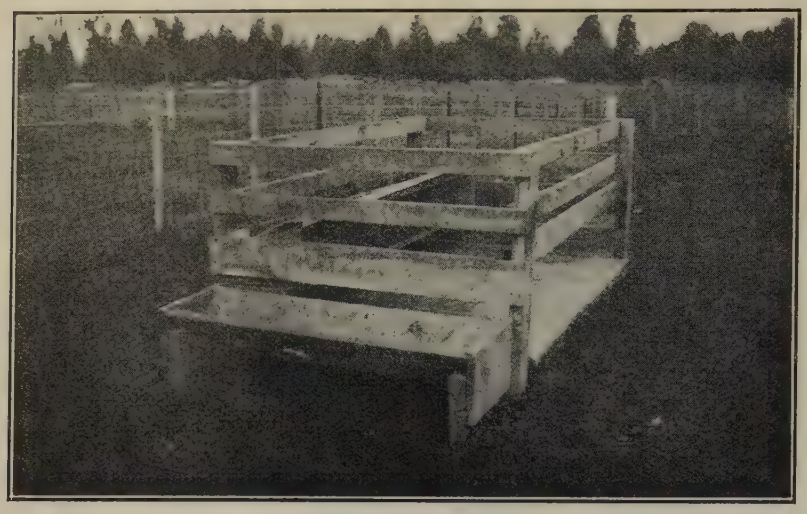


The movable creep which is discussed in this article.

scouring is leaving the skim-milk in the trough for several days until it has passed the sour stage and become decomposed and rotten.

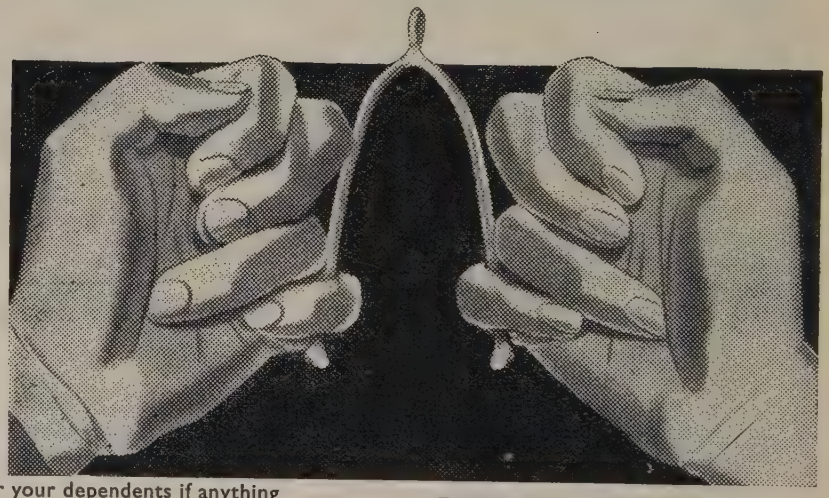
Movable Creep.

Meal has the advantage that it remains sweet indefinitely if kept dry in proper feeders. Meal is often taken more readily than skim-milk in cold weather, and it is especially valuable for early spring and late autumn litters. Little pigs are loath to leave their warm house in cold, wet weather, and for this reason a movable creep such as that shown in this article is valuable. The creep can be drawn up to the farrowing-house and placed partly across the doorway. A little meal scattered on the floor of the creep soon arouses the curiosity of the young pigs and encourages them to feed at the trough. A further method is to place a small meal-feeder behind the farrowing-rail.

The important point is to get the young pigs to take supplementary food as soon as possible, and to have them eating well before weaning takes place. The litter can then be separated from the sow for a gradually increasing length of time over the eight weeks of their lives, and can so be weaned easily and without any check in growth.

As an autumn oat for winter feed Resistance does not appear to be as satisfactory for South Otago conditions as one would expect. Several crops sown in autumn, both early and late, have been observed to give none or little feed before early September, while crops of Webb's Challenge grown on the same farm have been more rapid and vigorous in growth prior to and during winter than Resistance.

ACTIONS ALONE MAKE WISHES COME TRUE.



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Seed Wheat Certification.

List of Growers.

Contributed by the FIELDS DIVISION.

THE following is a list of growers whose wheat crops have passed both field and grain inspections as required under the Government scheme for the certification of seed wheat. The seed from these crops is not recognized as finally certified until it has been satisfactorily machine-dressed and the sacks suitably tagged and sealed. Previously lists of growers appeared in the March and April issues of the *Journal*, and further lists will be published later.

Variety.	Grower's Name and Address.	Acreage.
Cross 7 ..	Dixon, H. W., Mount Hutt R.D., Rakaia ..	20
	Macdonald, R., Annat	28
	Marshall, W. J., Tycho R.M.D.	3
	Mawson, I., Irwell–Leeston R.M.D.	18
	Souness, A., " Mount Steep," Milton	5
	Ward, W. J., Ohape, Temuka	5
Dreadnought ..	Newlands, G., Kauru Hill	50
Hunters II ..	Clelland, W. A., Ladbrooks–Springston R.M.D. ..	4
	Falloon, J., Waihao Forks, Waimate	26
	Kinnimont, J., Kauru Hill	30
	Newlands, G., Kauru Hill	34
Jumbuck ..	Holdaway, N. H., Dillon's Point Road, Blenheim ..	11
S.S. Tuscan ..	Talbot, P. R., Claremont R.D., Timaru	25
Tafaroa ..	Shuttleworth, R. H. and J., Benmore–Dipton R.D.	15

Local Marketing of Onions.

Procedure Amended by Regulations.

A. E. MORRISON, Solicitor, Department of Agriculture.

THE purpose of the Board of Trade (Onion) Regulations 1938, Amendment No. 1, is to amend the principal regulations—viz., the Board of Trade (Onion) Regulations 1938—in the manner indicated hereunder :—

(1) The Complaints Committee of the New Zealand Grain, Seed, and Produce Merchants' Federation is empowered to deal with disputes arising out of the sale of graded onions as to whether such onions have been correctly graded, irrespective of the district in which they were grown. Under the principal regulations this power existed only in the case of onions sold for delivery in the district in which they were grown. A consequential amendment permits onions which the Complaints Committee decides are not of the required standard as to grade to be sold anywhere ; but this provision does not apply to shipments of South Island onions for sale in the North Island, which, as in the past, require to be accompanied by a certificate as to grade.

(2) Where any onions, no matter where they are grown, have deteriorated in quality by reason of storage, &c., the person desiring to sell them may apply to the Director-General for a permit to sell the onions according to their then quality and condition. Previously this tolerance was extended only to onions grown in the South Island and shipped to the North Island for sale.

The amending regulations make provision enabling a member of the Onion Marketing Advisory Committee, not being a member of the Public Service, who uses his private motor-car in respect of his attendance on the business of the Committee to be paid a motor-car mileage allowance at the rate of 4½d. per mile.

One of the principal alterations effected by the amending regulations is that relating to the returns required to be made by onion-growers and wholesale onion-merchants. Not later than the seventh day after the close of each month other than the months of January and December in each year an onion-grower must present a return to the Director-General of Agriculture setting forth—

(*a*) The total quantity by weight of all onions delivered by him during that month.

(*b*) The total quantity by weight of all harvested onions held by him at the close of that month.

(*c*) The total quantity by weight of all onions grown to maturity or approaching maturity but not harvested by him at the close of that month.

In similar manner a wholesale onion-merchant must furnish a return showing—

(*a*) The total quantity by weight of all onions received by him from onion-growers during that month.

(*b*) The total quantity by weight of all onions delivered by him ex store during that month, but not including onions delivered for export.

(*c*) The total quantity by weight of all onions held by him in store at the close of that month.

In addition to the penalties prescribed by the Board of Trade Act, 1919, for offences committed against regulations made under that Act, the amending regulations provide that an onion-grower or wholesale onion-merchant who is convicted of making a false return shall be deprived of his certificate of registration for a period in the discretion of the Director-General of Agriculture, but not exceeding two years. During the period of suspension the onion-grower or wholesale onion-merchant may not carry on his business as such.

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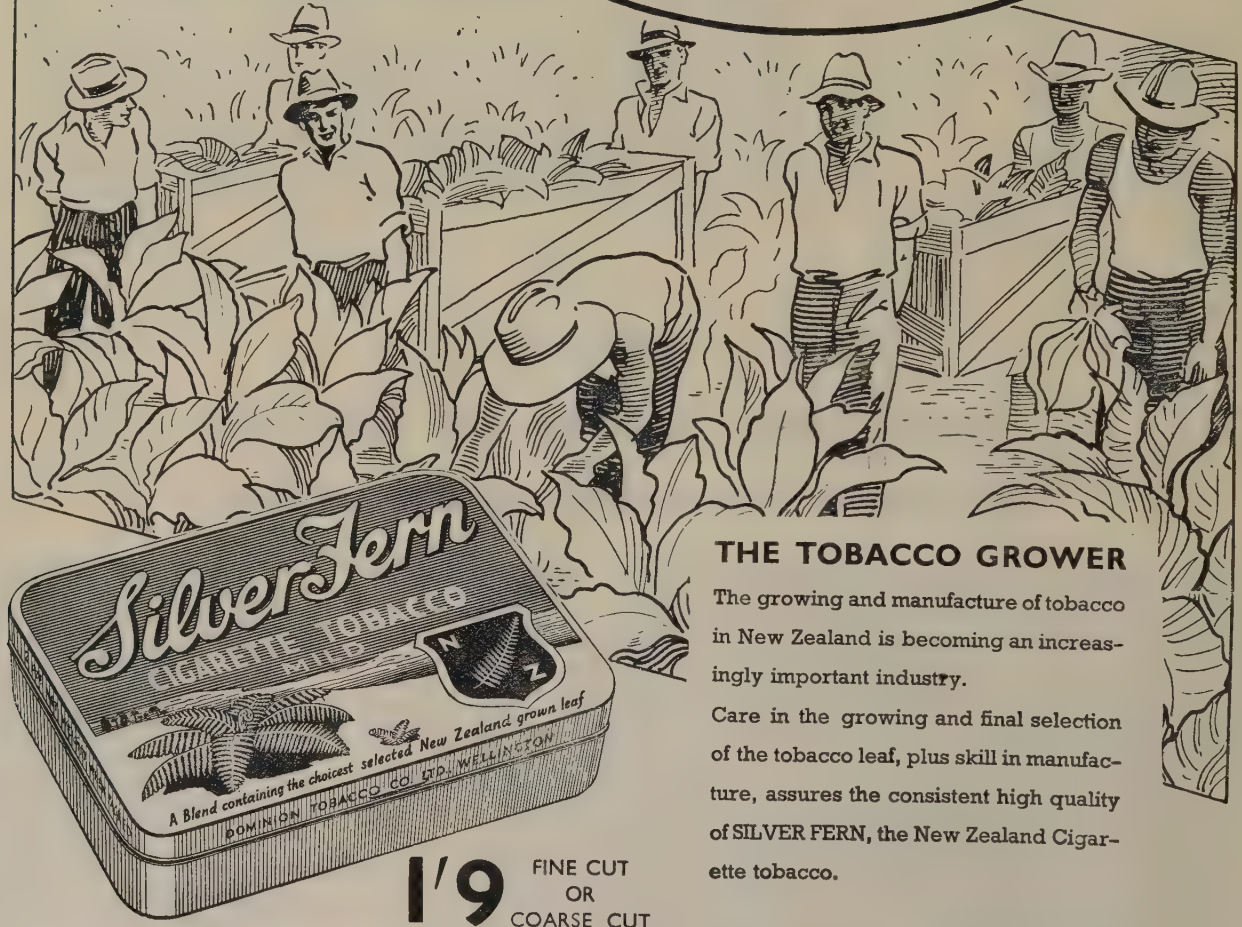

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Citrus Pests: (7) Scale Insects.

Unshielded Scales.—The Cottony Cushion Scale And the White Wax Scale.

W. COTTIER, Plant Diseases Division, Plant Research Bureau.

THE adult female (Fig. 1) of the cottony cushion scale (*Icerya purchasi* Mask.) is somewhat oval in outline, dark red or reddish-brown in colour, and covered with a yellowish mealy material. There is a mass of short woolly hair on the body. The pure white corrugated ovisac in which the eggs are laid is characteristic of this insect.

The average length of a fully grown female with egg sac is approximately 9 mm. The young "crawlers" are red in colour, and are covered with a yellowish cottony secretion. The legs and antennæ are more or less black, the antennæ being provided with long hairs at their extremities.

Fig. 1 (the cottony cushion scale).—Left: Clustered on a small branch. Right: An adult female scale magnified, showing the fluted character of the white egg sac. [*H. Drake, photo.*

Life-history and Habits.

The insect overwinters in the immature stages. It is said that the female is capable of producing about eight hundred eggs. In summer these eggs hatch in about fourteen days, and the period of development to maturity occupies from three to five months. There are two generations annually.

When the female begins to lay eggs she encloses them in a white felted material produced at the posterior end of the body. As egg-laying proceeds, more space is required to contain the eggs, and so the ovisac is made larger and larger until ultimately it reaches the form shown in Fig. 1. As the sac grows, the female becomes raised at the posterior end, and ultimately the only part of the insect in contact with its host is the head end containing the feeding apparatus, so that it may almost be said to be "standing on its head."

The cottony cushion scale feeds for the most part on the twigs. The young larvæ most commonly infest the mid-ribs of the leaves, but as development proceeds they migrate to the twigs and branches.

The sooty mould fungus is commonly associated with infestations of this scale.

Fig. 2 (the white wax scale).—Left: Young "star" forms on leaf. Right: Adult scales on twig. [*H. Drake, photo.*

Hosts and Distribution.

Food plants include citrus, acacia, gorse, wattle, Douglas fir, roses, dahlias, grape-vine, chrysanthemum, tung-oil trees, and pear.

Distribution is world-wide.

Control.

This scale is usually so well held in check by the introduced ladybird (*Rodolia cardinalis* Muls.) that additional measures are unnecessary. If it is desired to use a spray, summer-grade oil may be employed at a concentration of 1 part of oil to 60 parts of water.

White Wax Scale.

The white wax scale (*Ceroplastes sinensis* Del G.) (Fig. 2) is a recent arrival in New Zealand, and first came to notice in 1932. Up to the present time it has been erroneously known as *Ceroplastes rusci* L. and *C. rubens* Mask. (see *New Zealand Journal of Agriculture* 47, No. 4, p. 226, October, 1933).

The adult female is white, tinged with grey. Quite commonly in the younger stages half of the scale is coloured pinkish, the rest being more or less white. Around the lower edge in the fully grown insect there are seven darker spots with one at the apex. The shape is that of a cone, being much raised in the centre.

The average length of the full-grown scale is approximately 4 mm. to 5 mm., the width being a little over 3 mm. The very young stages are a dark reddish-brown, with eight radiating white waxy processes around the edge and one in the centre, the whole presenting a star-shaped appearance (Fig. 2).

Life-history and Habits.

There is only one generation of this insect per year in New Zealand. The female scales produce eggs in the period January–February, and it is stated by some authors that one female is capable of producing two thousand eggs. Most of these eggs are hatched by early March, and by April–May the young scales are in the "star" stage. Development continues slowly throughout the winter and spring months, the scales becoming mature about December.

The young stages usually appear on the upper surface of the leaves, while the adult scales are found clustering more or less thickly on the stems and small branches.

This scale secrets honeydew copiously, and infested trees are commonly covered with sooty mould.

Hosts and Distribution.

In New Zealand this species has been found on citrus, puriri, clematis, *Veronica* sp., *Fatsia* sp., tree tomato, and matipo. It is commonly found infesting puriri very heavily.

It has been considered that *C. sinensis* is a native of South America. Countries where the scale has been reported as a pest are France, Italy, Spain, Jamaica, Transcaucasia, Sicily, Algeria, Morocco, and almost all countries bordering the Mediterranean. It probably reached New Zealand on imported stock from some distance overseas.

Control.

Spray with summer-grade oil at a concentration of 1 part to 33 parts of water in the March–April period, when most of the scales will be in the young "star" form.

Citrus Trees Bare-poled.

The effects of the bare-pole or skeletonization system of pruning on citrus trees in the Kerikeri district can now be observed, fifteen months after the operation was carried out.

Firstly, lemon-trees so treated and well maintained since the pruning are now (October, 1938) not only strong, shapely trees, free from disease, but also are already in blossom.

Secondly, it would appear that the best months to undertake pruning of citrus is the opposite to most other trees, and is better done whilst there is the probability of good growth. These months are from September to March. Late autumn or winter pruning, although feasible, has a distinct retarding effect on the trees.

—A. M. W. Greig, Orchard Instructor, Auckland.

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Agricultural Regulations.

Dairy Registration and Inspection Amending Regulations 1939.

A. E. MORRISON, Solicitor, Department of Agriculture.

THE general requirement of the principal regulations under the Dairy Industry Act, 1908, relating to the inspection and registration of dairies is that no milk or cream shall be sold for human consumption other than that obtained from a registered dairy. In 1935, dairy companies were permitted to sell cream derived from an unregistered dairy as pasteurized cream provided that certain conditions were complied with.

The Dairy Registration and Inspection Amending Regulations 1939 restrict this right somewhat by providing that the owner or occupier of premises registered as a creamery under the Dairy-produce Regulations 1938 who sells milk for human consumption, but does not receive at his creamery premises any milk derived from an unregistered dairy, may sell from those premises cream obtained as cream from an unregistered dairy or cream obtained from premises registered as a skimming-station under the Dairy-produce Regulations 1938 at which all milk received is separated, provided that the conditions previously applicable to sale by dairy companies of cream derived from unregistered dairies are observed.

These conditions are : The cream must have been graded as "finest" pursuant to the provisions of the Dairy-produce Regulations 1938; it must be pasteurized so as to conform to the standard of pasteurized cream set out in the regulations under the Sale of Food and Drugs Act, 1908; and every package containing such cream must be labelled in accordance with the regulations made under the same Act. Every sale of such cream is made subject to the provisions of the Sale of Food and Drugs Act, 1908, the Health Act, 1920, and of the regulations in force which are made under the respective Acts.

The carriage of brewers' grains in a conveyance used for carrying milk, cream, or their containers to or from or about dairy premises was formerly prohibited. The amending regulations under notice permit the carriage of brewers' grains in such a conveyance subject to certain conditions—namely, the body of the conveyance intended for such use must be completely and effectively lined with metal, and before being brought into use it must be inspected and approved in writing by an Inspector. The conveyance must also be maintained in a clean and sanitary condition; and brewers' grains must not be carried in the conveyance at the same time as it is used for the carriage of milk, cream, or their containers.

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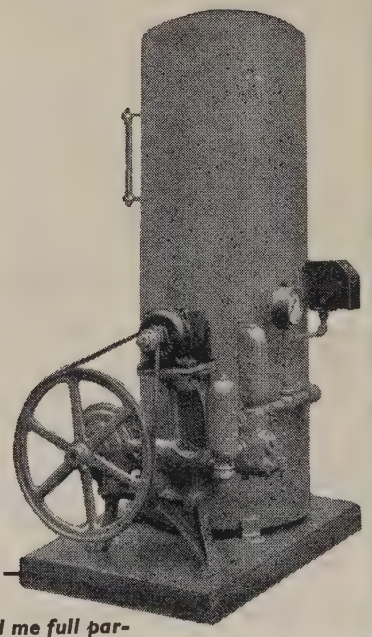

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Dry Rot in Swedes.

A CORRESPONDENT, D. F. S. (Raetihi), writes as follows: I would be obliged if you could give me advice regarding swede crops. I put in a two-acre paddock of swedes with a sprinkling of chou-moellier about 20th November, 1936. I used 3 cwt. of special turnip manure and had a splendid crop. This season (20th December, 1937) I again sowed a similar mixture. The first year I noticed dry-rot in a few swedes. This year, after the swedes had grown to about three-quarter size, the rot started and destroyed every swede and rotted the stems of some of the chou-moellier.

I have six acres of new growth with practically the same mixture this year. I notice the rot is evident in different parts of the paddock, and I am anxious to avoid a failure next year, as this is practically the only ploughable land I have, and a crop of swedes is valuable. The swede used is Superlative, and the soil is good, heavy quality, between hills, and I notice the richest parts affected most. I am wondering if a heavy dressing of lime, say 1 ton per acre, would help, and, if so, would it be best to top-dress immediately after the sheep have finished or just after ploughing in November? I have no evidence of club-root, although brown-spot is seen in a few swedes.

The Fields Division replies that where dry-rot occurs, even in scattered patches in a field, it is not advisable to attempt another crop of swedes in the same area for some years, certainly not the following year. The spread of rot through a swede crop to the extent of affecting most of the crop often occurs where chou-moellier sown with swedes is fed off some weeks before the swedes are required. The animals damage the swedes and carry the infection from plant to plant.

The growing of chou-moellier with swedes, although frequently practised, is not recommended, as neither crop is anything like as good as could be obtained by growing them separately. There are two or three varieties of swedes which withstand dry-rot better than Superlative, among which may be mentioned Vilmerin, Wilhelmsburger, and Suttons Sensation. Any of these are recommended for conditions where dry-rot is probable, and the two former particularly where swedes are required for late feeding in the winter.

Although affected by rot this year to a much greater extent than usual, due to damage by white butterfly allowing the rot to attack the plants, chou-moellier is much less susceptible than swedes, and for this reason can be successfully grown after a slightly infected swede crop. Chou-moellier is taking the place of swedes for this reason in many districts where soft-rot is bad.

By growing one of the swede varieties mentioned as a first crop after grass, followed by one or two crops of chou-moellier, then back to grass for as long as possible while one or two other areas of ploughable land are used for cropping, the difficulty of having to grow two or more successive swede crops can be avoided. There is no evidence that heavy liming will have any effect on the incidence of dry-rot, but lime can be used with advantage on land used for cropping. It is best applied after disking.

HAS YOUR PRODUCTION *INCREASED* THIS YEAR?

Writing on 26/4/39, Mr. W. CARTMILL of Cambridge, says—

"Since January we have taken from 150 lb. up to 200 lb. of milk per day more than last year, and you know what a dry spell we've had—not a drop of rain since 29th January until the other day."

Another user in the Wanganui district sent his factory returns from 1st January to 10th April.

1938 - 7,022 lb. of fat. 1939 - 7,689 lb. of fat.

The experiences of these men are an indication of what the **BEVIN HARROW** has done for **hundreds** of others and **will** do for **you,** if you want to progress.

Incidentally, you'll have to do your experimenting for yourself, because, although we have asked responsible Officers of the Department of Agriculture to conduct experiments both with harrowing during the dry weather—and with harrowing in conjunction with varying quantities of fertilizer, to ascertain how little manure farmers actually need—we can get no satisfaction. We have been informed verbally that they are **too busy.**

From the experience of many hundreds of users, we know that the **BEVIN HARROW** will get results that will more than please you—hence our written guarantee makes provision for returning the Harrow up to 12 months after use, if you have not received results which are both satisfying to you, and well worth while.

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Great Growth of Feed from Crop of Black Skinless Barley.

A farmer at Heriot put a crop of black skinless barley in a 35-acre paddock. The rate of seeding was 2 bushels per acre. The sowing took place in December and was followed by exceptionally hot, dry weather. However, at five weeks there was a great growth and 700 lambs were turned in. After ten days it was noticed that the barley was still getting away and a mob of 900 two-tooth ewes were turned in to try to control the growth. These were left for six days, and at that time 500 of these were taken out; the balance were left with the lambs. Despite this heavy stocking the crop continued to give a great growth of feed and at the same time was fattening the lambs, as most of the original 700 were drafted off fat.

Poultry Feeding Experiment.

Relative Merits for Egg Production.

W. L. JOURDAIN, Poultry Overseer, Wallaceville Poultry Station.

TO ascertain the relative merits for egg-production of five methods of feeding an experiment was conducted at the Wallaceville Poultry Station during the period from 1st April, 1938, to 2nd February, 1939. The five methods were as follows :—

1. ALL grain feeding (wheat, maize, barley, oats) and meat-meal in an open hopper.
2. MASH : Bran, pollard, and meat-meal. GRAIN : Wheat, maize, barley.
3. MASH : Bran, pollard, maize-meal and meat-meal. GRAIN : Wheat, maize, barley.
4. MASH : Bran, pollard, meat-meal and salt. GRAIN : Wheat, maize.
5. MASH : Bran, pollard, meat-meal. DRY MASH : Bran, pollard. GRAIN : Wheat, maize, barley.

Two hundred pullets, divided into five pens of forty each, were used in this test. The pullets were all of the same age, hatched on 20th October, 1937, and were as even in size and type as it was possible to select them. The five houses used were of the same size and type, being of the open-fronted, leanto type, 15 ft. wide by 20 ft. in depth.

All five pens were fed twice each day at approximately 7 a.m. and 3.30 p.m. In addition, feed oats were given in the litter at midday at the rate of ½ oz. per bird. These oats were measured out according to the number of birds in each pen each day.

The green food fed at approximately 4 p.m. (after the night feed) consisted of young, green oats and silver beet which had been chaffed just previously. From the beginning of June until the end of October each pen was given two or three carrots every day in addition to the other green food. These carrots were fixed on the walls on nails which had been partly driven into an upright, and the birds were allowed to pick at them. After the birds became used to these carrots they ate them ravenously.

Oyster-shell and gravel-grit were also supplied in open hoppers.

The meat-meal fed to pens 2, 3, and 5 was varied from 5 per cent. to 10 per cent., according to the time of the year. Pen 4 received a fixed amount all the year round, and pen 1 was given as much as it required in an open hopper.

PEN 1.

(All grain.)

The following is the grain mixture which was fed at the beginning of the test :—

Table 1.

Wheat	28 lb.
Maize	25 lb.
Oats	22 lb.
Barley	25 lb.
Total	100 lb.

Shortly after the start of the test the birds in this pen were seen to be leaving some of the grains, and it was thus necessary to reduce some of them, especially the oats. It was found necessary several times to alter the mixture, with the result that the mixture being fed to this pen at the finish of the test was very different from that used at the start.

The final figures were as follow :—

Table 2.

Wheat	48 lb.
Maize	20 lb.
Oats	6 lb.
Barley	10 lb.
Total	84 lb.

The meat-meal consumed by this pen amounted to slightly more than that consumed by pens 2, 3, and 5 and three times as much as pen 4 (see Table 7).

PEN 2.

(Bran, pollard, and meat-meal mash and mixed grain.)

The following are the mash and grain mixtures :—

Table 3.

Mash—	
Bran	16 lb.
Pollard	32 lb.
Meat-meal (5 per cent. by measure)	6 lb.
Total	54 lb.
Grain—	
Wheat	60 lb.
Maize	20 lb.
Barley	20 lb.
Total	100 lb.

These birds had their mash mixed with milk, and were always eager for their mash feed.

PEN 3.

(Bran, pollard, maize-meal and meat-meal mash and mixed grain.)

The following are the mash and grain mixtures :—

Table 4.

Mash—	
Bran	9 lb.
Pollard	32 lb.
Maize-meal	8 lb.
Meat-meal (5 per cent. by measure)	5 lb.
Total	54 lb.
Grain—	
Wheat	60 lb.
Maize	20 lb.
Barley	20 lb.
Total	100 lb.

This mash was mixed with water, and the birds in this pen at no time seemed as eager for their food as the birds in pen 2, although they did eat a little more by the end of the test. It will also be noted on a glance at Table 8 that this pen laid 149 eggs fewer than pen 2. It is, however, impossible to say whether or not it was the milk with which the mash was mixed for pen 2 that gave the slightly larger egg production.

PEN 4.

(Bran, pollard, meat-meal and salt mash, and wheat and maize grain.)

The following are the mash and grain mixtures :—

Table 5.

Mash—	
Pollard	60 lb.
Bran	34 lb.
Meat-meal	6 lb.
Salt	1 lb. 6 oz.
Total	101 lb. 6 oz.
Grain—	
Wheat	67 lb.
Maize	33 lb.
Total	100 lb.

This method of feeding is followed at the Hawkesbury Agricultural College (N.S.W.), and has been used in this test for the purpose of comparison with the Wallaceville method, which is that of pen 2. An outstanding fact in Table 9 is that, whereas there were deaths in all the other pens in this test, pen 4 went right through the test with no deaths at all. The mash was mixed with water the same as with pen 3. The only difference between the ingredients in the mash in this pen and those in the other pens was the inclusion of 22 oz. of salt in each mixing, and also the deletion of barley from the grain-mixture.

It is, however, impossible to say whether these two alterations have had any effect on the health of this pen (4), but it is a very significant fact which will bear further examination. This fact is so striking that this method of feeding will be carried out again next year in competition with three other feeding-methods.

The birds in this pen laid the largest number of eggs during the test, but the other pens were handicapped in that they lost some birds through deaths. It will be noticed that no birds were removed from this pen until 18th November. The birds in pen 5 gained steadily on this pen after November and were only forty eggs behind at the finish.

PEN 5.

(Bran, pollard, and meat-meal wet mash; bran, pollard, dry mash.)

The following are the mash and grain mixtures :—

Table 6.

Wet Mash—	
Bran	16 lb.
Pollard	32 lb.
Meat-meal (5 per cent. by measure) ..	6 lb.
Total	54 lb.
Dry Mash—	
Bran	18 lb.
Pollard	16 lb.
Total	34 lb.
Grain—	
Wheat	60 lb.
Maize	20 lb.
Barley	20 lb.
Total	100 lb.

This method is exactly the same as pen 2 (Wallaceville feed), with the addition of the dry mash, which was before the birds all the time. The mash was mixed with milk and, although these birds did not appear as eager for their food as those in pen 2, it can be understood when it is considered that they had the dry mash as well as the wet mash.

The following tables give :—

(1) The cost and amounts of food consumed (Table 7).

(2) The number of eggs laid and the amount received for them (Table 8).

(3) The deaths, &c., in each pen for the duration of the test (Table 9).

(4) Net profit over cost of foods (Table 10).

Table 10.—Net Profit over Cost of Food; also Average Profit per Bird.

Pen No.	Number of Weeks.	Number of Birds at Start.	Average Number of Birds during Test.	Total Number of Eggs laid and sold.	Amount received for Eggs.	Total Cost of Foods.	Net Profit.	Average Profit per Bird.	Average Cost per Dozen to produce.
				Doz.	£ s. d.	£ s. d.	£ s. d.	s. d.	d.
1	44	40	37	427½	33 15 3	14 5 0	19 10 3	10 6·5	8·00
2	44	40	35	436⅜	34 19 8	13 4 9	21 14 11	12 5·1	7·28
3	44	40	36	423 11/12	34 0 8	14 2 11	19 17 9	11 0·5	8·00
4	44	40	39	498½	39 11 4	15 2 8	24 8 8	12 6·3	7·28
5	44	40	38	495 5/12	40 18 10	15 10 2	25 8 8	13 4·6	7·52

Notes on Experiment.

Unfortunately, there were a large number of deaths in pens 1, 2, and 3, and this detracts very largely from the results which can be drawn. These deaths were mostly due to vent-picking and oviduct disorders.

Table 10 shows that, although pen 5 cost more to feed, it also showed the biggest profit not only as a pen, but also individually. The cost of production of each dozen eggs also varies considerably; pens 2 and 4 were very even in that their eggs cost 7·28d. to produce.

The Wallaceville method of feeding (pen 2) seems to give consistently good results each year. This year, although there were the least average number of birds in the pen and they were third in net profit, the average profit per bird was very little below pen 4, which came second in both net and average profit. Last year the cost of production of each dozen eggs ranged from 8d. to 9½d., whereas this year it has dropped as low as 7·28d., as in the case of pens 2 and 4.

Table 7.—Quantities and Costs of Food Consumed.

Foodstuff.	Average Price.	Pen 1.		Pen 2.		Pen 3.		Pen 4.		Pen 5.	
		Quantity used.	Cost.	Quantity used.	Cost.	Quantity used.	Cost.	Quantity used.	Cost.	Quantity used.	Cost.
		lb.	£ s. d.	lb.	£ s. d.	lb.	£ s. d.	lb.	£ s. d.	lb.	£ s. d.
Pollard ..	£7 8s. 5d. per ton	..	..	594	2 2 1	652	2 8 5	660	2 8 11	764	2 16 8
Bran ..	£6 9s. 2d. per ton	..	..	297	0 19 0	184	0 11 11	377	1 4 4	472	1 10 6
Meat-meal	£7 8s. 9d. per ton	186½	0 12 1	166	0 11 0	151½	0 10 1	66	0 4 5	159	0 10 6
Maize-meal	£1 6s. per 200 lb.	..	..	..	..	164	1 1 4	..	..	..	..
Wheat ..	7s. 1d. per bushel	943	5 11 4	796	4 13 11	787	4 12 11	999	5 17 11	870	5 2 9
Maize ..	6s. 5·5d. per bushel	548	3 3 2	266	1 10 8	262	1 10 2	492	2 17 2	290	1 13 7
Barley ..	4s. 10·5d. per bushel	300	1 9 3	266	1 6 0	262	1 3 6	..	..	290	1 8 3
Oats ..	4s. 5d. per bushel	593	3 5 6	344 7/16	1 16 9	351⅛	1 18 10	380⅜	2 2 0	371 1/16	2 1 1
Salt ..	10 lb. for 1s.	..	..	..	..	..	..	15¼	0 1 6	..	..
Grit ..	5s. 1d. per 100 lb.	72	0 3 8	105	0 5 4	107	0 5 9	126	0 6 5	135	0 6 10
		..	14 5 0	..	13 4 9	..	14 2 11	..	15 2 8	..	15 10 2

Table 8.—Eggs Laid and the Amount Received for Them.

Month.	Average Price per Dozen.	Pen 1.		Pen 2.		Pen 3.		Pen 4.		Pen 5.	
		Dozen.	Value.	Dozen.	Value.	Dozen.	Value.	Dozen.	Value.	Dozen.	Value.
	s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.
April	2 6·775	3⅜	0 9 5	5¼	0 13 6	5⅝	0 13 11	8⅝	1 1 7	16	2 1 0
May	2 6·02	23⅜	2 17 6	26¾	3 6 9	24½	3 1 3	30	3 15 1	39½	4 19 10
June	2 2·876	35	3 18 5	40¼	4 9 9	42½	4 15 2	41⅜	4 12 2	47½	5 7 4
July	1 10·733	44	4 3 4	44½	4 5 1	44⅜	4 4 0	43	4 1 6	33½	4 3 3
August	1 6·071	48½	3 13 2	49¼	3 14 7	46⅝	3 9 11	57¼	4 6 4	43½	3 5 5
September	1 3·296	55½	3 10 10	57½	3 13 9	54½	3 9 11	66½	4 4 10	60¼	3 17 5
October	1 3·340	62½	3 19 11	61	3 18 11	57½	3 12 11	76½	4 17 3	68½	4 17 7
November	1 5·066	54½	3 18 0	53⅛	3 16 1	53½	3 15 6	62¼	4 8 2	62¼	4 8 6
December	1 5·104	50½	3 11 5	49⅝	3 10 1	48⅝	3 8 5	57½	4 1 4	61½	4 7 1
January	1 5·341	47½	3 8 6	45½	3 6 3	44½	3 4 9	52½	3 16 6	57⅜	4 3 4
February	1 10·76	2½	0 4 9	2½	0 4 11	2½	0 4 11	3½	0 6 7	3¾	0 7 1
		427½	33 15 3	436⅓	34 19 8	423½	34 0 8	498½	39 11 4	495⅝	40 18 10

Table 9.—Deaths.

Pen 1.			Pen 2.			Pen 3.			Pen 4.			Pen 5.		
Number of Deaths.	Date.	Birds left.	Number of Deaths.	Date.	Birds left.	Number of Deaths.	Date.	Birds left.	Number of Deaths.	Date.	Birds left.	Number of Deaths.	Date.	Birds left.
..	1/4/38	40	..	1/4/38	40	..	1/4/38	40	..	1/4/38	40	..	1/4/38	40
1	23/5/38	39	1	15/5/38	39	1	16/6/38	39	4	18/11/38	36	1	9/6/38	39
1	23/6/38	38	1	18/6/38	38	1	22/7/38	38	(culled)	..	..	1	14/8/38	38
1	9/7/38	37	1	9/7/38	37	1	18/8/38	37	..	..	..	1	18/8/38	37
1	27/11/38	36	1	27/7/38	36	1	30/8/38	36	..	..	..	1	30/12/38	36
1	8/12/38	35	1	15/9/38	35	1	7/9/38	35	..	..	..	1	22/1/39	35
1	19/12/38	34	1	2/10/38	34	1	4/10/38	34	..	..	..	..	..	..
1	27/12/38	33	1	20/10/38	33	1	18/11/38	33	..	..	..	..	..	..
1	30/1/38	32	1	30/10/38	32	(culled)	..	..	..	..	..	..	..	..
..	..	..	2	..	..	..	..	..	..	..	..	..	..	..
..	..	..	(culled)	18/11/38	30	2	18/11/38	31	..	..	..	..	..	..
..	..	..	1	4/1/39	29	(destroyed)	..	..	..	..	..	..	..	..
..	..	..	1	25/1/39	28	..	..	..	..	..	..	..	..	..

A call to all!

To-day New Zealanders are beginning to appreciate the vast value of this country's manufacturing industries; and the extent to which supporting them stimulates national prosperity. There is scarcely any imaginable industry which has not some footing on New Zealand soil. Almost any article which can be made economically in New Zealand is being made here—and of a quality which silences criticism. The development of secondary alongside primary industries is an additional safeguard of prosperity.

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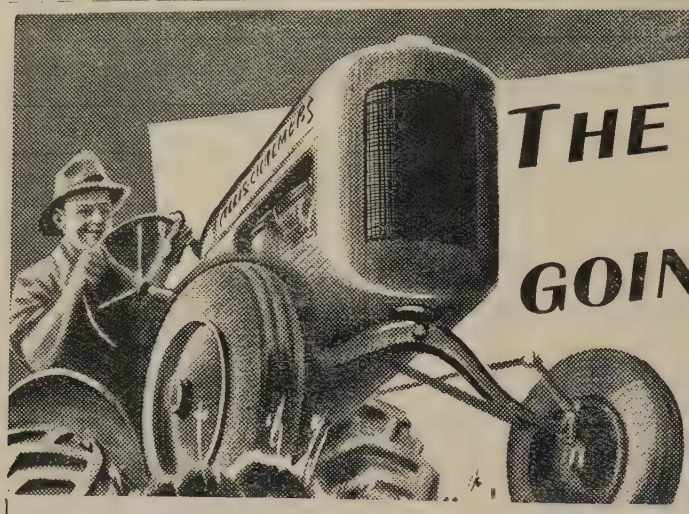

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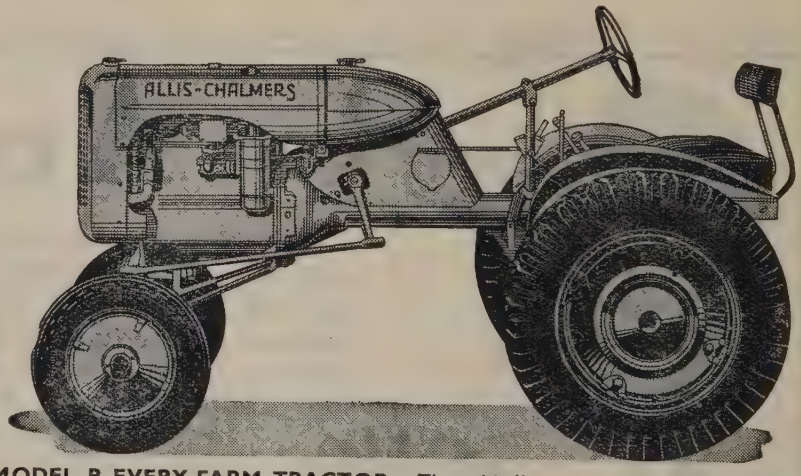

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A.J.

Veterinary Notes for the Farmer.

Discussions on First-aid Measures.

Contributed by the Live-stock Division.

Preventing the Spread of Cow-pox.

COW-POX is a contagious disease which frequently occurs among milking-cows. The disease is caused by what is known as a filterable virus—*i.e.*, the causal agent is capable of passing through the finest bacterial filter. Outside the body the virus seems to remain active for a considerable time around byres, &c., unless disinfection is carried out.

At the start of the disease some constitutional symptoms, such as slight fever, will be present, but probably this will go unnoticed by the attendant, whose suspicion becomes aroused by the appearance on the teats and udder of reddish painful papules, which in the course of a day or two change into vesicles or blister-like lesions containing clear fluid, these being surrounded by red, inflamed areas.

Development.

The next stage in the development of the lesions is the change of the vesicles to pustules, the contents of the pustules being more turbid or thick in appearance. Provided these pustules are not interfered with by the hands of the milker they mature in about eight to ten days, when they dry up, forming scabs. The scabs gradually dry and fall off, leaving shallow depressions or "pits," which remain obvious for some time but gradually disappear.

These are the stages through which lesions go in the course of their development provided they are not interfered with, but in practice pustules become ruptured by the hands of the milker, so that fresh infection takes place, and lesions in all stages of development are usually observed on the teats and udder of an affected cow. Painful bleeding areas are frequently produced, the disease running a very prolonged course.

Cases of mastitis often result from extension of the scab to the point of the teat and infection through the teat ducts.

As soon as the eruptions are observed on the teats the affected cows should be kept apart from the others and milked last. This is advised, as otherwise infection will be carried from infected to clean cows by the hands of the milker.

Dressing the Teats.

When the vesicles or pustules become ruptured, as they do in most cases at milking, the lesions should be kept as clean as possible. To soften the scabs the teats should be washed with warm soda-water and the sores then dressed with boracic or zinc ointment, the ointment being used freely during milking to keep the teats soft. Another useful dressing is a mixture of equal parts of tincture of iodine and glycerine.

In order to safeguard himself from infection the attendant should thoroughly wash and disinfect his hands after handling affected cows, as human beings may contract cow-pox from contact with animals suffering from the disease.

As a precautionary measure against spread from affected to clean cows a separate attendant should milk affected animals, having nothing to do with the others. The milk from the affected cows should be fed to pigs or calves. When the lesions on the teats and udder have healed up and the outbreak is considered to have cleared, the byres and yards should be disinfected.

Heart Injury in Cattle by Foreign Bodies.

QUITE a common form of injury to the heart in cattle is pericarditis —*i.e.*, inflammation of the thin sac which envelops the heart—set up by some foreign body.

As is well known, cattle have a habit of chewing and swallowing objects not intended as food. Very often metal objects are found in the stomach, such as nails, needles, pieces of wire, hairpins, knitting-needles, sack-needles, &c. Such metallic objects become lodged in the reticulum—*i.e.*, the second portion of the stomach. The sharp end becomes fixed in the wall of the reticulum, and the muscular contractions force it through the wall and then through the diaphragm—*i.e.*, the muscular partition between the chest and abdominal cavities.

The apex of the heart is very close to the location of the puncture through the diaphragm; a small distance of only about 2 in. separates the heart from the second portion of the stomach. The movements of digestion and respiration force the foreign body on, and the pericardium is pierced and also occasionally the heart itself.

Severe inflammatory changes follow as the result of infection along the path of the foreign body, ultimately leading to the death of the animal.

By this means many valuable animals have been lost. The risk of traumatic pericarditis would be minimized if more care were exercised in the disposal of old wire, nails, &c. These should not be left lying about where it is possible for cattle to ingest them.

It is as well to remember the possibility of wire being left in baled hay after the bales are opened up for feeding.

Lead-poisoning in Cattle.

LEAD-POISONING in cattle is by no means uncommon. It is due to animals having access to freshly painted structures, and may be caused through old paint-tins and white-lead containers not being carefully disposed of. Cattle are notoriously inquisitive, and paint seems to have some added attraction for them.

Cattle grazing on rifle ranges have been poisoned by lead from the bullets, and lead shot carelessly disposed of from open cartridge cases has been known to be responsible.

The main symptoms of acute lead-poisoning are gastro-enteritis, derangement of the nervous system, with twitching and convulsions, salivation, and a nasal discharge. Later, blindness may follow, and the affected animal will stumble into any available object.

The symptoms generally extend over a considerable time, but may end in death after twenty-four hours.

As regards treatment, the primary step must be to stop the source of the lead supply. Give Epsom or Glauber salts. These are sulphate of magnesium and sodium respectively, and by chemical action either tends to form lead sulphate, which is insoluble.

Give bulk doses of tea or coffee with milk, and keep the animal warm.

Dosing for Hydatids.

DOG-OWNERS have by now received a yearly supply of arecoline after registering their animals, and will notice that this drug is supplied with the idea of ultimately eradicating hydatids. The primary object of the Dog Registration Amendment Act, 1937, is the prevention of hydatids in human beings. This particular hydatid also occurs in the livers and lungs of sheep, and by eating these organs the dog becomes infested with a very small tapeworm.

Several other kinds of hydatids occur in different hosts (one of these hosts is the dog louse) and when swallowed by the dog give rise to various tapeworms, some of which are several feet long. Therefore, when you are dosing your dog with arecoline and find as a result that he passes large tapeworms there is no need to be unduly alarmed that the family has been exposed to infection of a serious nature.

On the other hand, if the sheepman doses his dogs and does not see any resultant tapeworms he should not conclude that the dangerous one is absent, as it is very small and not easily seen unless a careful search is made.

Dogs kept under strictly town conditions are not very likely to be harbouring the tapeworm which gives rise to hydatids in the human subject, but, as mentioned above, they do have other worms which may be effectively expelled by arecoline, so that all dog-owners should use the drug provided in order to benefit the dogs themselves.

If the dogs have not yet received their second dose of worm medicine this year the dosing should be carried out at once.

Answers to Inquiries.

Probable Causes of Poor Lambing Returns.

G. H. M. (WANGANUI RIVER) :—

I have been discussing with some of my neighbours the probable causes of the poor lambing returns this season, and there are a few questions I should like answered if possible.

(1) How soon after lambing does a ewe come in season again ?

(2) How many heat periods does a ewe have in the course of a year ?

(3) What is the extent of time between one heat period and another ?

(4) Is there any pronounced variation in regard to the above as between the various breeds of sheep ?

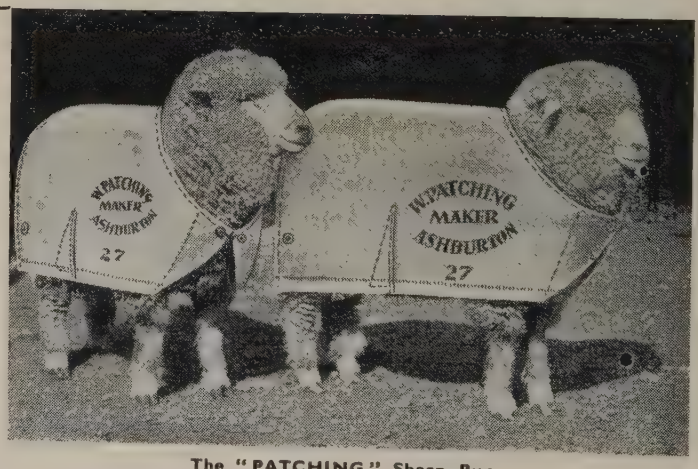
The lambing returns here are varying from 40 per cent. to round about 75 per cent. under practically similar methods of handling the stock at tupping-time, with the exception of a fair variation in the dates of mating the flocks. The lambing has been most erratic this year. My own percentages show a variation of as much as 45 per cent. as between different paddocks, ranging from 100 per cent. in high, shady country to 55 per cent. in a low-lying, sunny area.

Live-stock Division :—

A certain amount of information is available, including this *Journal*, November, and December, 1933.

Appearance of heat in the ewe is to some extent influenced by climate, the animal's health, and nutrition level, and is thus variable. In most breeds there is a definite breeding-time in the autumn, with several heat periods, followed by a prolonged interval when there is no heat, which includes most of the summer. Where climate and feed conditions are favourable that interval may be shortened.

The merino breed in New South Wales under favourable conditions may show a continuous cycle of heat periods throughout the year. The Dorset Horn breed



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may be so managed as to produce two crops of lambs in a year.

The interval between heat periods (length of cycle) varies with different breeds and localities. Gill (this *Journal*, November, 1933) quotes the following records: Hampshire, Shropshire, Southdown—U.S.A, 14–16 days; Merino—South Africa, 16–19 days; Scotch Blackface—Highlands, 21 days; Scotch Blackface—Lowlands, 13–18 days; Romney—New Zealand, 15–18 days; duration of the period, about two days.

I have no accurate record of how soon after lambing a ewe comes in season. It must depend on (1) whether lamb lives and is suckled, in which case no period could be expected until after weaning, and (2) where lamb died, on feeding and climatic conditions.

The variations in lambing percentages on the different classes of country as noted by yourself are interesting and are in agreement with other experience. One must regard this as due to unusual climatic conditions emphasizing the natural differences in the two types of grazing.

Last autumn Mr. W. M. Webster, M.R.C.V.S., found at Massey College that during a period immediately preceding the appearance of facial eczema in the flock his experimental rams were sterile. In eczema-affected flocks in the Waikato a large percentage of ewes continued to return, but it was not decided whether this was due to infertility of the rams or of the ewes. It has been noted that where, during early autumn, ewes are subjected to long treks extending over several weeks no heat periods are observed until they begin to improve in condition on better feed. The influence of nutrition or sudden digestive upsets would seem important.

One would think that in your case the better percentage on the high, shady country may have been due to a more even distribution of green feed throughout summer and autumn, as opposed to some drying up followed by a flush on the sunny country.

Sores on "Buttons" of Wethers.

A. T. W. (DANNEVIRKE):—

I would be glad if you would give me some information through the veterinary notes of your *Journal* as to the cause of sores on the "buttons" or ends of the sheaths of wethers or wether lambs. The

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

surrounding wool becomes matted over the "button" and, when removed, discloses a very nasty looking sore. Some are not very bad, but others in advanced cases seem very bad, almost as though the "button" were being eaten away.

Woolly lambs seem to be affected as much as shorn ones, which seems to prove that being accidentally cut at shearing-time is not the cause.

I have been cleaning the wool away from affected lambs and applying a dressing of equal parts of kerosene and castor-oil. I have had very good results with the above mixture as a dressing for "scabby" mouth, but whether it will be successful in this case I do not know.

Any information you can give me on this question will be most acceptable, as it seems to be rather a common complaint this year in this district.

Live-stock Division:—

This condition is commonly spoken of as pizzle-rot. It is most frequently seen in wethers, but occasionally rams are found affected. The cause of the condition has not been determined, but the disease is most frequently seen in wethers being fattened on arable crops, where it would appear as if urine-stained wool becomes infiltrated with dirt, leading to matting of the wool, fermentation of urine in the matted wool, and later pus-formation and the appearance of the ulcers or sores. The sores are commonly infected with a soil organism, and are difficult to heal.

Treatment consists of ringing or clipping the wool from around the point of the sheath for an area of a few inches. It is advisable to segregate all affected sheep for convenience of treatment. If the sores are present on the skin and external parts of the sheath the application of a 10 per cent. copper-sulphate ointment made up in vaseline will effect a cure after a few applications. It is necessary to remove the scab and all dead tissue underneath the scab. The ointment should be rubbed in until it adheres to the affected part

If the sores are extending into the sheath it may be necessary to open up the sheath at its lower border. Scabs and dead tissue are now removed with cotton-wool and the sheath is syringed out with a 5 per cent. solution of bluestone in water. After syringing, apply a dressing of the 10 per cent. bluestone ointment. After a few applications of this treatment good results should be obtained.

If rams are infected it is necessary to avoid any incision of the sheath. In this case, after the removal of the scabs and dead tissue and a thorough cleaning of the part, the use of a pencil of silver nitrate will be effective in cauterizing the sores and stimulating healing.

Thorough treatments carried out once weekly should very soon bring about recovery.

Pulpy Kidney Vaccine

(Entero-Toxaemia)

ORDERS for entero-toxaemia vaccine, made at the Commonwealth Serum Laboratories, Parkville, Victoria, are now being filled by the Animal Research Station, Wallaceville, where stocks are held for New Zealand requirements.

Farmers who are considering the vaccination of their ewes this season are requested to write at once for particulars and prices, if their order has not already been placed. Mention the number of ewes to be vaccinated, and also the date lambing will commence.

Particulars are obtainable from any Inspector of Stock, the Department of Agriculture, or from the Officer-in-Charge, Animal Research Station, Private Bag to Wallaceville, Wellington.

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Farm Practice and Management.

Contributed by Officers of the Fields Division.

The Mole or Plough Drain.

EVERY farmer wishing to get the best results from his land must realize that until his farm is properly drained the most profitable results are out of his reach.

To-day there are still many farms in New Zealand which could, and would if allowed better drainage, respond with results greater and more profitable than they are at present able to give. Every year sees the advent of some new pest or trouble connected with the agricultural farm, and there is no doubt that if the farmer wishes to survive among all these he must obtain the best results from his farm, and he can do this only if his farm is adequately drained.

With an acute shortage of farm labour, the New Zealand farmer, when thinking of drainage operations, has first of all to consider cost. There is no doubt that this is a big problem to be confronted, but the farmer should realize that money spent on draining his paddocks is very soon returned to him at the rate of several pounds for a pound spent, and a drain well laid gives returns for many years.

Method of Drainage.

There are numerous methods of drainage practised throughout the world to-day, but one method which is worthy of serious consideration not only because of the small outlay required, but also because of the splendid results obtained, is the use of the mole, or plough, drain. In Southland especially the mole drain is extensively used, and there is no doubt that farmers are resorting to its use more and more as the years go by. The method is easily carried out, being extremely fast when compared with the laying of tile drains, is very light on the purse, and is, when properly done, extremely effective.

The drain is made with a plough, which is usually drawn by a tractor. The plough has an adjustable knife, to the bottom of which is attached a mole, or plug. By drawing the plug through the soil at a given depth a clear passage is left for water to drain out to the outlet, which is generally situated in an open ditch, or is sometimes connected to a tile drain.

Depth of Drain.

Regarding the depth at which the drain is best made, one should be sure that it

A close-up of a mole drainage cut which has opened and cracked from the effect of dry weather.

is in the subsoil but not any deeper than is required to ensure that the comparatively crumbly surface soil is avoided. Mole drains made in the crumbly surface soil will not last for as many years as otherwise, because the sides will crumble and block the passage, thus stopping the flow of water.

It is usually considered suitable to place mole drains at a depth of anything between 17 in. to 21 in. The size of the mole or plug varies, but the plug found most suitable in Southland is 3 in. in diameter.

Like any other drain, the mole drain must be kept open and clear at the mouth, and for this reason it is advisable to dig a trench at the opening of each drain and place in tiles. If this is done there is not the same risk of having the mouth of the drain breaking down and blocking the outlet. When making the drain the ground should be studied carefully beforehand to ensure that the best fall is obtained. It is desirable to have a fall of not less than 4 in. to the 100 ft. On the other hand, too much fall will mean the destruction of the drain, for if the water is allowed to run too quickly it will gradually wear down the sides of the drain and thus cause a collapse and a blockage.

Avoidance of Obstructions.

Perfectly flat areas, and also depressions, must be avoided by the drain, for these would cause silting and the subsequent blockage of the drain. When hard pans causing the lifting of the plough are encountered it is best to mark the place and later open and fill in at the correct depth with tiles.

Mole draining is best carried out in the winter, when the subsoil is moist but not too wet, for if too much moisture is present at the time the sides of the drain will present a glazed surface, which does not allow as quick a passage of water into the drain as would otherwise be the case.

Where a 3 in. plug is used a tractor is required to pull the plough, but six or eight horses are sometimes used to pull a plug of 2½ in. diameter. The tractor is more satisfactory, however, for with even the smaller plug the load is very heavy for horses. A good practice when draining a paddock with this method is to run out numerous drains at least about 6 ft. or 7 ft. apart. Where possible, run the drains across the general fall of the paddock rather than with the fall.

Rate of Construction and Cost.

With the soil in a good, moist condition, and with a strong tractor, it is an easy matter to make mole drains at the rate of one and a half to two miles per hour, providing the pulls are not too short.

The cost can be estimated at from 10s. to 25s. per acre for this method.

One disadvantage with this method is that when drought conditions prevail following the making of drains the soil, upon drying, tends to open and crack severely where the knife has passed along. A good example of this was to be seen on the Invercargill Showgrounds last summer, where, as the result of the drain plough, great openings appeared on the surface, and a steam roller was employed to iron these cracks out and so prevent accidents to stock.

—W. L. Harbord, Instructor in Agriculture, Invercargill.

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Germination of Seed Wheat.

MANY instances of the partial failure of wheat sowings resulting from the use of seed of low-germinating capacity have been reported during the past three years.

Trouble of this kind appears to have been more frequent than formerly. This is probably due to the fact that, as a result of unfavourable seasons and the increasing use of direct heading methods, a considerable quantity of wheat has been harvested with an excessive moisture content. Wheat in this condition is liable to be injured either through heating or through bruising of the germ. By such injuries grains are rendered incapable of germination, or they produce only weakly abnormal seedlings, which are practically useless.

Many of the samples of wheat received at the Seed-testing Station for germination tests have come from growers who had already found their sowings to have failed. In most cases the seed was found to be at fault. While it is interesting to establish the cause of the trouble it is more profitable to prevent it by having the seed tested before sowing.

Wheatgrowers are therefore urged to avail themselves of the free seed-testing service provided by the Department of Agriculture. To do this it is necessary merely to post a sample to the Department of Agriculture, Seed-testing Station, Box 442, Palmerston North, enclosing within the packet the sender's name and address and a request for a germination test.

Care should be taken in drawing the sample to ensure that it is representative of the bulk. The best procedure is to take a small quantity of grain from two or three positions in each sack.

The germination test for wheat samples occupies twelve days. At the completion of this period the percentage germination taking place in six days and in twelve days is reported. Good seed should give a six-day result in excess of 80 per cent.

—E. O. C. Hyde, Seed Analyst, Seed-testing Station, Palmerston North.

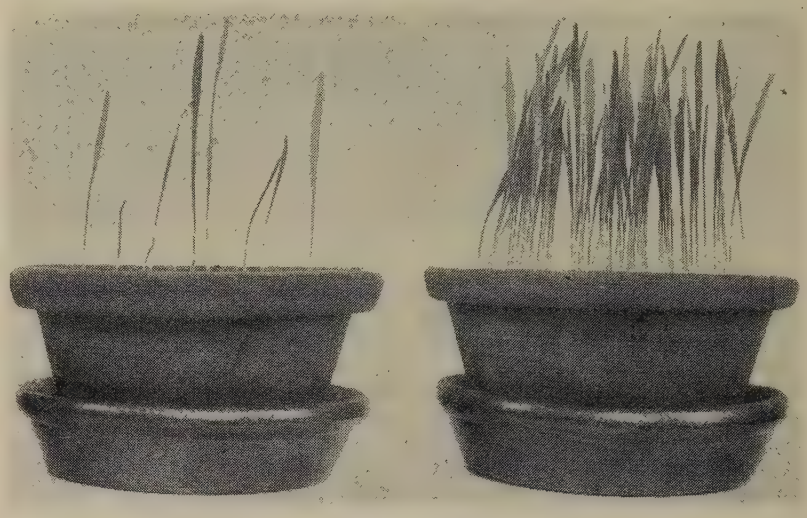

Fig. 1.—Germination tests photographed on the twelfth day, illustrating differences in seed quality. One hundred grains have been sown in each pan.

Black Skinless barley has done well in South Otago following sowing last autumn during a very dry period. It germinates quickly, is ready to feed in about eight weeks, stands fairly severe grazing, and recovers quickly after grazing. Even at the end of winter and early spring it was giving more feed than Resistance oats sown at the same time in a field on one particular farm.

Fig. 2.—Abnormal seedlings arising from bruised and cracked grains. These are incapable of establishing plants in the field.

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Grassing Poor Hill Country.

A CORRESPONDENT, G. G. (Hutt Valley), asks for advice for the grassing of poor hill country in the Hutt Valley :—

Being a subscriber to your *Journal*, I wonder if you would advise me regarding the grasses to sow on an area of 30 acres of poor hill country which I have at great expense stumped and ploughed, he writes. I propose to apply 4 cwt. of basic slag per acre. The soil varies from 4 in. to 8 in. over clay and rotten rock to almost pure clay.

Although the first ploughing and stumping has cost about £16 per acre, a second ploughing and harrowing would cost only about £2 per acre. Would it therefore be advisable to sow down a temporary pasture of, say, cow grass and Italian rye-grass and the permanent pasture later. Some of the land has been in heavy gorse and a second crop is almost inevitable, and it is for this reason, as well as the advantage to be gained by a second working, that I am inclined to favour a temporary pasture.

Having spent so much money on the initial breaking in, I naturally do not mind reasonable extra expense to ensure a really good permanent pasture in the end.

Fields Division's Reply.

The Fields Division replies :—

The type of country you have had ploughed can be made to grow a satisfactory permanent pasture. The actual stumping and initial ploughing is, however, only part of the proper preparation of such land for a good type of pasture. The procedure recommended is as follows.

Endeavour to have the area worked down to a satisfactory seed-bed with the disks and harrows by about the middle of February or early March. The earlier this preparation can be done the better, but the ability to get a good seed-bed early will depend on whether disking or harrowing of the original ploughing was carried out before the land dried out too much.

It is a mistake to leave such land lie during dry weather in the furrow slices, because, once it is dry, breaking down to a suitable seed-bed is very difficult until it has been subjected to a good deal of rain again. The sowing of a temporary pasture is advised. The seeds mixture should be up to 30 lb. Italian rye-grass and 5 lb. to 6 lb. of red clover.

This pasture, if sown early, can be expected to give a considerable amount of feed and to last up to two years. In the first season up to December the Italian rye-grass will provide the bulk of the feed, and during the second year the red clover should be more prominent. In the second spring an endeavour should be made to get an early crop of hay and to have the land ploughed again early in December, immediately double disked and harrowed, and then allowed to lie through the summer.

If gorse seedlings come away a disking in January and again in February in hot dry weather will kill them if they are not left to get too well established. These cultivations in hot, dry weather are also extremely important in the consolidation of the lower layers and in conserving moisture. Early sowing in late February or early March of the permanent pasture mixture is strongly recommended. A suitable mixture would be :—

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	Per acre. lb.
Government certified perennial rye-grass	30
Certified Akaroa cocksfoot ..	7
Crested dogstail	2
Government certified white clover	2
Italian rye-grass	3
Montgomery red clover ..	2
	46

With regard to manuring, 3 cwt. to 4 cwt. of basic slag with the permanent grass-seed or the same quantity of superphosphate following, say, 5 cwt. to 10 cwt. of lime would give the pasture a good start. A second top-dressing with 2 cwt. to 3 cwt. of superphosphate again in the spring of the autumn-sown permanent pasture will be found to give excellent results, particularly in encouraging the clovers, and is strongly recommended.

The cultivation immediately after ploughing in December, the long summer fallow, and occasional cultivation to kill gorse and weeds in dry weather and to conserve moisture so that early sowing can be done while the land is still warm, are the main points in good pasture establishment on such land, and the second application of manure in the spring of the first year is also very profitable and important.

If the programme as set out is carried out a good permanent pasture well worth carrying on by top-dressing and capable of high production should be secured.

Pitting the Potato Crop.

FAULTY pitting of the potato crop must result in considerable annual losses throughout Canterbury. When one realizes the labour and expense involved in growing the crop one often wonders at the lack of thought, in many cases, given to the care of the tubers from the time they are dug until they are disposed of. Instances can be seen in most districts where poorly constructed pits have led to considerable waste in the way of frosted and damaged potatoes.

The necessity for a properly constructed pit with the tubers well protected from the weather is increasingly essential on those farms where certified seed is produced. Frosted potatoes, particularly, are a source of annoyance, as it requires only a few of them in each sack to spoil the appearance of a line. The necessity of repicking lines which contain frosted potatoes could be largely avoided if more care were exercised in protecting the pit from the weather.

Fig. 1.—(a) A useful but inexpensive shed for the storage of potatoes; (b) a well-constructed pit in which baled wheat straw has been used for the sides and ends. The trees at the back afford protection from the prevailing bad weather.

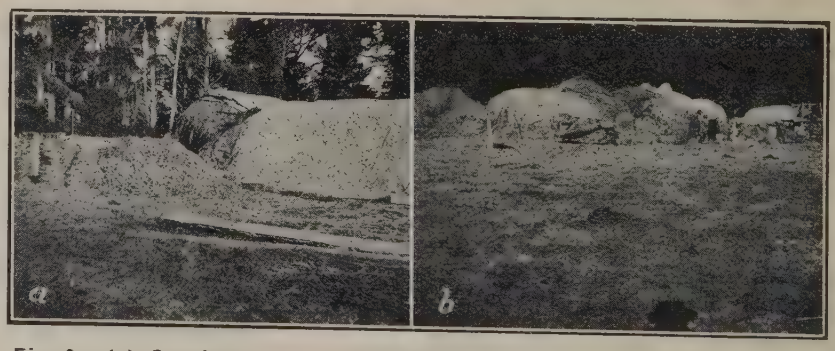

Fig. 2.—(a) Opening up a well-covered pit; (b) a type of pit which is not recommended because of its small protection from frost damage.

Ample Shed Room.

The possession of ample shed room to store the potatoes—and more so the seed—is undoubtedly an advantage where seed in any quantity is produced. Not only does this allow of adequate protection, but grading can be carried on when weather conditions do not permit work outside. Sheds are expensive to build, however, and consequently few farmers possess sufficient room to enable the potato crop to be stored inside.

Fig. 1 (*a*) depicts a shed which is becoming increasingly popular in potato-growing districts. It is ideal for the storage of potatoes, and, moreover, is relatively inexpensive to construct. The sides and ends are composed of baled wheat straw, and the roof of oat straw. The dimensions of the shed shown in the photograph are 50 ft. by 16 ft., and it is capable of holding one thousand sacks, or considerably more if the potatoes are tipped. End measurements of the shed are as follow: Width, 16 ft.; height of walls, 6 ft. 6 in.; distance between apex of roof and cross-beams, 5 ft.

The bales are each 3 ft. long; and in building the sides and the ends each alternate row is laid with the middle of the bales exactly over the join of the two bales on the row beneath. To avoid overlapping, several half-sized bales are required for the corners. Tuscan straw is considered the most permanent, and, as the bales are exposed to the atmosphere, galvanized baling-wire should be used in preference to the ordinary baling-wire.

In the construction of this shed two hundred bales, or approximately six tons of straw, were used. Oat straw is considered superior to wheat straw for the roof, as the former is less likely to slip.

Building the Roof.

The best method of building the roof is to thresh a stack handy to where the shed is being constructed. Some sheds of this type are built with a flat roof, but they do not remain waterproof for any great length of time. The gable roof is the most efficient. The roofing-timber should protrude well over the side walls to prevent water damage to the bales. On most farms there would be no necessity to purchase timber for the roof supports; blue-gum or macrocarpa serve the purpose quite well.

In Fig. 1 (*b*) the sides and ends of this pit are constructed with a double tier of baled straw held in position by means of stakes. This is an excellent method of pitting potatoes, although a slight amount of frost damage can be expected, as the ends of most bales are somewhat irregular and when stacked do not fit tightly together. The measurements of the pit shown are 66 ft. by 9 ft. One hundred bales were used in its construction, and its capacity is five hundred sacks of tipped potatoes. The potatoes are covered on top with sacks and then a thick layer of straw. The selection of the site for a pit is important. The one shown in the photograph is sheltered from south-westerly rain and snow by the row of pine trees at the back.

Fig. 1 (*c*) also shows a well-constructed pit, which differs essentially from the previous type in that no baled straw has been used. A cross-section of the pit, as shown in Fig. 2, gives a good indication of the protection afforded the tubers from the weather.

Construction of the Pit.

It will be noticed that the bottom of the pit is 1 ft. or more below ground-level. This enables a considerable quantity of potatoes to be stored underground, thus reducing the amount of straw and number of covers required. If there is shingle underneath, the drainage is apparently sufficient to keep the bottom of the pit dry. The pit should not be made too deep, however; otherwise difficulty will be experienced in handling the sacks of potatoes after they are graded. Manure-sacks are used next to the ground, as they are liable to rot.

A common method of storing potatoes during the winter is to bag the tubers and then to stack the bags in a sheltered position. This practice is largely adopted with table potatoes and also with seed potatoes, particularly if the latter are to be mechanically graded. The square-shaped stacks shown in Fig. 1 (*d*) have the disadvantage that they are difficult to make watertight. A long, narrow stack is easier to protect from rain, snow, or frosts. Bundles of straw, held in position by threading binder-twine through the sacks, is probably the best method of protecting the sides and ends of the stack. In addition, the top should be well hearted-up with straw to prevent water gaining access.

—G. K. McPherson, Instructor in Agriculture, Ashburton.

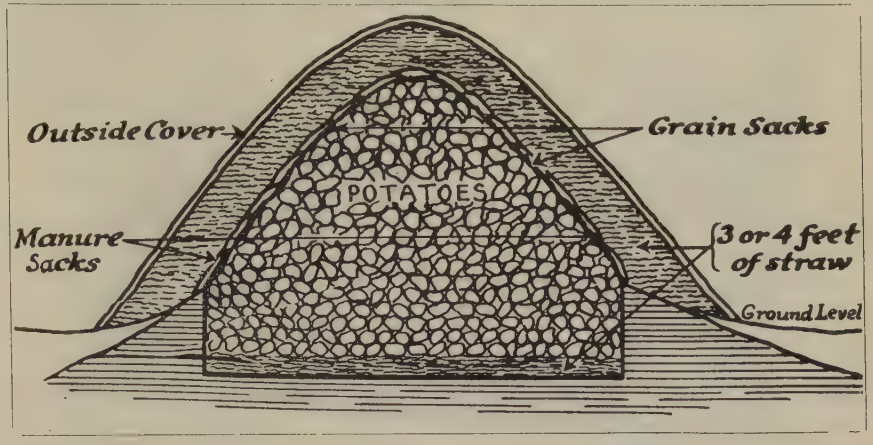

Fig. 3.—A cross-section of a potato-pit.

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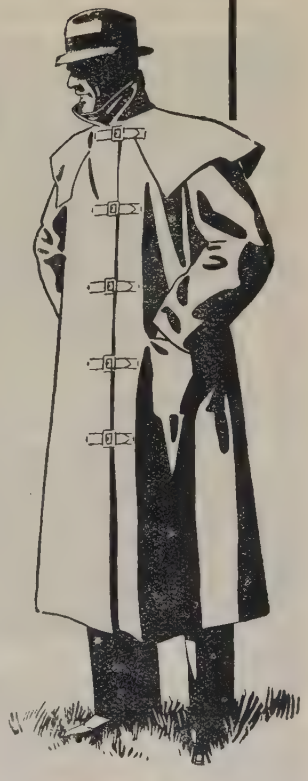

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Maize Variety Trials in North Auckland.

The exhibit of maize varieties grown on the Dargaville Demonstration Farm and in the Ruawai district displayed at the Whangarei Winter Show.

A RENEWAL of interest is being displayed in North Auckland in growing maize for grain, particularly for carrying store pigs through the winter in a thriving condition. Farm practice in the Bay of Plenty, as well as experimental work at Ruakura and Dargaville, has already shown the value of the maize crop for this purpose.

One acre of maize yielding 60 bushels of grain will be sufficient to winter twenty pigs for three months, and with only a small area grown it is imperative that, in addition to adequate cultivation and manuring of the crop, only the best variety be sown. Unless procured from a crop grown in an isolated position, seed maize is most likely crossed, and unless careful selection of the seed cobs in the field is undertaken any variety will tend to deteriorate rapidly.

For some twenty years a number of farmers on the Ruawai Flats have grown and produced a good strain of the old variety Prairie Queen. Others purchasing seed maize of both unknown and known

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origin have obtained indifferent results. The alluvial soils of the Northern Wairoa are not early soils; a wet spring will hinder cultivation work considerably and delay sowing even into December. Consequently, the variety which is considered likely to do well under North Auckland conditions is one which matures early after a short growing season and yet yields heavily at the same time.

Start of Test.

The testing of maize varieties was begun last season on the Northern Wairoa Experimental and Demonstration Farm at Dargaville in conjunction with a maize crop which was being grown for grain for pig-feeding-trial work. Seed of five varieties was procured by the Agronomy Division of the Plant Research Bureau from Australia, while three local varieties and four varieties from the Bay of Plenty were also included.

The trial was sown on 11th November, 1937, and was fertilized with a mixture of superphosphate two parts plus blood and bone one part at 5 cwt. per acre. Harvesting took place from 21st April to 18th May, 1938.

The results for the first season were as follows :—

Variety.	Origin of Seed.	Yield per Acre.
		Bushels.
Johansson's White	Dargaville	69·7
Hickory King	Australia	69·0
Otumoetai Horsetooth	Bay of Plenty	64·9
Prairie Queen (No. 2 selection)	Ruawai	64·8
Iowa Silvermine	Australia	64·5
Wellingrove	Australia	64·3
Funk's Yellow Dent	Australia	58·6
American Early	Bay of Plenty	57·4
Prairie Queen (No. 1 selection)	Ruawai	56·9
Early Butler	Bay of Plenty	55·1
Golden Glow	Australia	48·8
Keam's Rough Dent	Bay of Plenty	48·1

Arrangements have been made to continue variety trials for another year. It is hoped that in time one proven variety will be grown on the Demonstration Farm, and this will, in addition to providing grain for pig-feeding, enable pure supplies of seed maize to be made available to North Auckland farmers.

—E. H. Arnold, Instructor in Agriculture, Dargaville.

Establishing Paspalum.

A farmer in the Te Puke district has reported considerable success in establishing paspalum. He had a field on partly-drained land where the main covering was rushes with paspalum scattered throughout. The paspalum had been allowed to run to seed one year. The following November the rushes were burnt off without chipping, and by February the burnt patches were a mass of young paspalum plants. Apparently the seed had withstood the fires, since it must have lain there from the previous autumn. Another farmer in the same district has claimed considerable success in improving paspalum strike by immersing the seed in boiling water before sowing.

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Horticultural Instruction.

Contributed by Officers of the Horticulture Division.

Orchard Notes.

Pruning Operations.

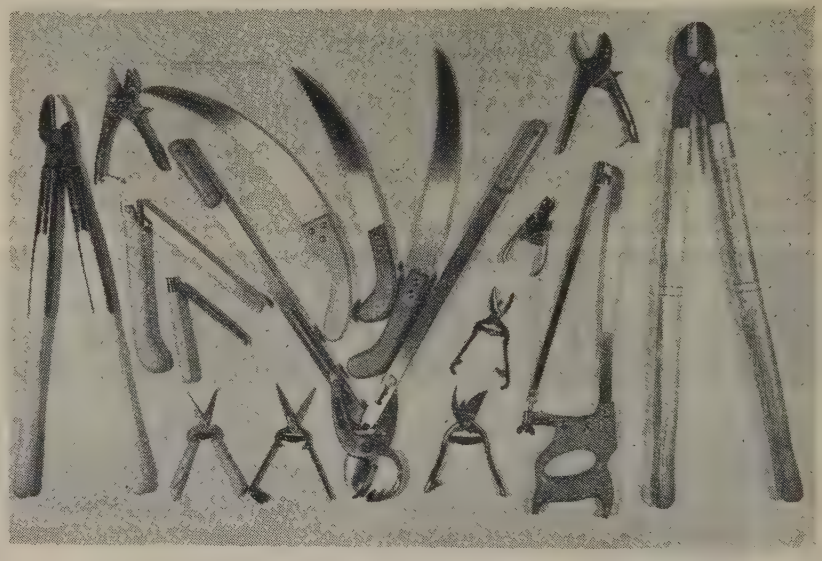
THE principal orchard activity during the next few months will be pruning the pip and stone fruit trees. It is usually a long job when a detailed pruning is carried out, and unless an early start is made and advantage taken of every fine day for pushing ahead with this work pruning operations may become so protracted as to hinder the essential spring work of ploughing, cultivating, and applying earlier sprays.

In a mixed orchard it is always possible to make an early start with stone-fruit trees because of their earlier defoliation.

Pruning is only one factor in successful fruit-production and, although an important one in securing a balance between wood-growth and fruit-bearing, it does not necessarily follow that success in orcharding can be achieved by skilful pruning alone. Other important factors controllable by the orchardist—soil fertility, conservation of moisture by cultivation, disease-control, fruit thinning, shelter, and drainage—must each receive due attention, and pruning is then regulated by the effect of all these other factors to secure the full advantage of each.

If growth is rather prolific through improved growing conditions brought about by cultivation, application of fertilizers, &c., pruning must necessarily be lighter in order that such growth may be utilized either in allowing an expansion in the tree-size, or turning at least a portion of it into fruit-bearing. By lighter pruning is meant a moderate thinning out but little shortening of new shoots.

On the other hand, if growth has stagnated through overcropping or poor growing condition much heavier pruning is desired to stimulate growth, and this would consist sometimes of reducing the number of main limbs, cutting back extended lateral growths, and even reducing the height of leaders in more extreme cases.



A comprehensive collection of pruning implements.

Framing Young Trees.

One of the main objects in pruning is to model young trees along certain lines, having in mind the ideal of a strongly framed tree symmetrical in shape and of the inverted cone type. This is best accomplished by shortening in the earlier years the annual vertical extensions after selecting those best placed and removing any surplus shoots, at the same time suppressing strong lateral growths which may tend to rival the leading shoots.

The general trend in pruning is to develop fewer main limbs in a tree, and to allow them to extend more rapidly by less harsh cutting and to grow rather longer horizontal secondary arms, thus bringing a tree into heavy bearing much earlier. It is not wise to go to extremes in tree building by reducing leaders to, say, three and allowing a full extension each year, as the height increases too rapidly before a strong lower framework is produced.

It may be accepted as a general principle that stone-fruit trees, particularly peach and nectarines, may be allowed to extend more rapidly than apples and pears, as the hard cutting back of leaders creates a mass of growth during the following summer, preventing the maturing of many

shoots. Most of the pruning work is in treating bearing trees, and it must vary greatly according to the age and condition of the trees, the variety and the kind of fruit.

Peaches and Nectarines.

The fruiting-habit of the nectarine is identical with that of the peach. Fruit is borne on one-year-old wood, and consequently a fairly heavy pruning is required each winter in order to maintain a constant supply of new fruit-bearing wood. Unless an abundance of good vigorous shoots are produced each year a peach-tree may be considered to be in an unthrifty condition, and fruit-production is doubtful.

The natural habit of the peach is to carry its bearing area higher each year, leaving unfurnished non-fruiting branches. Thinning out to ensure adequate light reaching all parts is necessary to keep the lower framework sufficiently furnished with new growths. A detailed treatment of the lighter growths is necessary in regulating the crop and forcing new shoots.

This work consists mainly in cutting back extended laterals to a healthy shoot arising from nearer its base. It is preferable to retain the well-ripened, short, stocky laterals rather than the slender shoots for fruiting. It is more economical to reduce the crop to a required amount as far as possible by pruning than by hand-thinning the fruit later.

Apricots.

The apricot produces the bulk of its fruit laterally on fruit spurs which are relatively short-lived. A relatively small portion of the crop is produced on one-year shoots.

The pruning system must be such as to cause the continued renewal of the fruit-spur system. A fairly vigorous growth should be maintained, and as the tree becomes older and only short growth follows a thinning system of more severe cutting may be necessary.

Cherries.

Cherries are borne on long-lived spurs (ten to twelve years) and consequently less renewal of fruiting wood is required, probably less than any other deciduous fruit-trees. Once the tree is brought into bearing little pruning is necessary to maintain it in a productive condition.

As new growth is mostly from terminal buds there is a tendency to develop long, polelike branches unless some heading back is done. Moderate cutting back of leaders for four or five years or until the framework is completed is necessary. Further heading will cause delay in fruiting, as encouragement to make shoot-growth by heavy cutting will render fruit-spur development impossible.

Proper soil-conditions must be maintained in order to keep a cherry-tree in a good state of vigour, and no reinvigorating of weak trees will be brought about by pruning alone unless soil conditions are improved at the same time.

Japanese Plums.

Japanese plums are borne laterally upon short, thick spurs, mostly on wood two years and older. A small proportion of the crop is produced on one-year wood, mostly at the base of strong shoots. The fruit-bearing habit is similar to that of the apricot, the principal difference being that the spurs on the Japanese plums are longer-lived.

Because of their prolific bearing, and as only large fruit is of commercial value, fairly heavy pruning must be resorted to in order to reduce the fruits in number and to induce sufficient growth.

European Plums.

European plums do not tend to overproduce as do the Japanese varieties; hence, a lighter pruning, with the idea of encouraging bud-production, is necessary, rather than a heavy pruning to reduce the amount of fruit-producing spurs. Most of the pruning required would be in removing worn-out portions and broken branches.

More detailed notes on the pruning of pip-fruits will be provided next month.

Wound Dressings.

It is very necessary, particularly with stone-fruit trees, to dress all large wounds to assist in the healing process and to prevent the entry of silver-blight or other organisms. The heavy toll of stone-fruit trees through silver blight could be very much reduced if all large wounds were trimmed and dressed immediately after being made. Bitumen paint is the most suitable material for this purpose.

—N. J. Adamson, District Supervisor, Nelson.

Citrus Notes.

Preparation for Planting.

CULTIVATION and spraying operations will now be practically over for the current season.

The menace of brown-rot, however, requires emphasis at this season, and growers are advised to take special precautions if this fungus disease has been noted in the orchard during past winters. The autumn Bordeaux 3–4–50 spray should be applied at once if this has not yet been done, but brown-rot is a soil fungus which thrives in the presence of moisture, so that other action besides spraying is necessary.

Keep all trees pruned clear of the ground so that the spores cannot be splashed on to the lower foliage, and, if a cover-crop has not been sown, stir the soil continuously around the tree. Brown-rot is often serious in orchards where fowls are permitted to run, and special care should be taken in these groves.

Where frost damage has been known to occur, growers are advised to act. Details of frost-prevention methods were outlined by Mr. Lloyd Williams in the October, 1937, issue of the *Journal*.

Drainage Important.

Drainage is also important during the winter months, especially on some of the heavier soils in the vicinity of Auckland City. Citrus-trees will rapidly degenerate and succumb to such diseases as collar-rot and bark-blotch if water is allowed to become stagnant near the roots of these trees.

For the intending planter this season early preparation is necessary. First, the trees should be personally selected as soon as possible and left in the nursery until all preparations for planting have been made.

The essentials of a good citrus-tree are—

(*a*) Stock suitable for the soil upon which it is intended to plant.

(*b*) Buds selected by a reliable nurseryman from proved trees.

(*c*) A good straight trunk about 18 in. long.

(*d*) Bud union well above ground-level.

(*e*) Three or four evenly spaced leaders.

(*f*) A tree which has only been budded once or twice and not cut back several times in the nursery.

(g) Healthy green bark—not brown or broken due to cicada damage.

Preparing the Site.

Having chosen the trees, prepare the site. This should now be well sheltered and well cultivated, with a green leguminous cover-crop. Secure a reliable man to assist, and carefully peg out the selected site. Special points to remember are—

(1) Distance apart. For sweet oranges this should be 15 ft. to 18 ft. if trees are on Infoliata stock, 22 ft. for most trees on sweet-orange or Citronella stock, and 24 ft. for lemon-trees on either of these stocks.

(2) Straight rows. In pegging out an area there is little difficulty if the site is perfectly flat, but on undulating country discrepancies easily arise. The distance apart is the horizontal distance, so that on any slope a plumb line will readily assist; otherwise the trees will be planted closer than intended and the lines will not be true when viewed from all angles. An orchard inaccurately set out is always an "eyesore."

(3) Leave sufficient room at the ends of rows for headlands between the last tree and the shelter-belt. A distance of 40 ft. is desirable.

When the area is pegged out the holes may be dug. These should be about 3 ft. in diameter. Some growers have been inclined to dig very large holes. This is quite unnecessary if the soil has been properly prepared and subsoiled. It is also a heavy expense to dig such holes. In removing the soil the first spit should be placed on one side of the hole and the subsoil scattered around. By this method the tree will obtain a good start on richer soil.

Further details may be obtained from the September, 1938, issue of the *Journal* or from the local Orchard Instructor. It cannot be stressed too firmly or too often that intending planters should obtain all the information available from the Department of Agriculture before planting if this has not already been obtained before the purchase of the orchard site.

—L. Paynter, District Supervisor, Auckland.

Cool Storage Notes.

The Jonathan Apple and Soft Scald.

THE Jonathan variety of apple is, no doubt, one of the best of our dessert varieties when grown under normal seasonal conditions. There is something in the flavour of the Jonathan that appeals to the consumer. Its shape and colour also make for attractiveness in a window where fruit is displayed for sale.

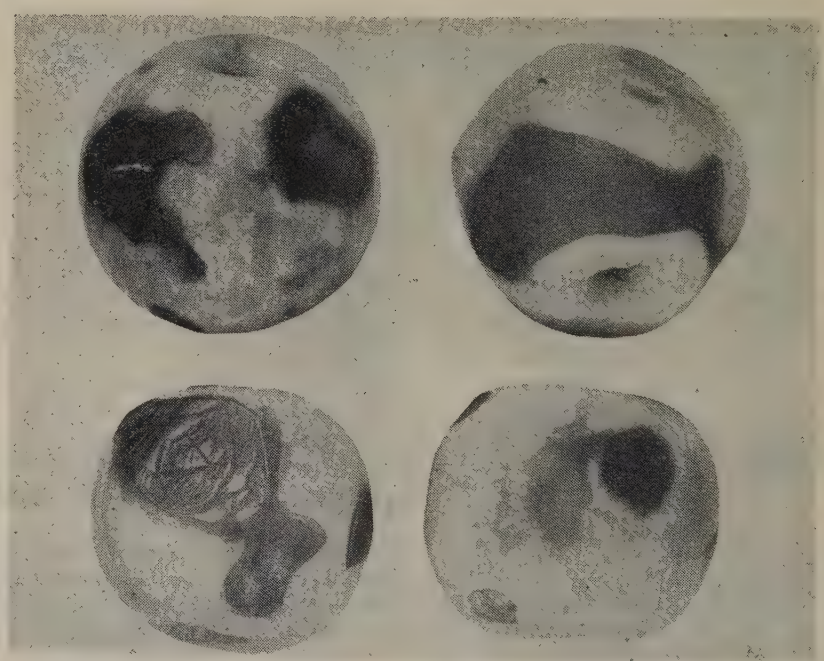
The climatic conditions during the maturing period of the fruit this season have provided just the ideal conditions for the production of the Jonathan variety at its best. In the first place the texture of the fruit is firm and of excellent flavour, as well as possessing qualities which will prolong the cool-storage life considerably without the loss of the finer qualities it possesses.

The following is the rainfall for the Nelson district this season: December, 6·33 in.; January, 1·03 in.; February, 0·06 in.; March, 0·15 in.

The tendency of the Jonathan to break down when held under good cool-storage conditions should be negligible this season.

Although the Jonathan is one of the finest dessert varieties produced, unfortunately seasonal conditions prevailing very often do not favour its normal growth and maturing process, and heavy losses are sometimes experienced from the many forms of breakdown which occur during its cool-storage life.

The Jonathan tree is generally found to be fairly consistent in producing a crop of fruit each year when the pruning of the tree and the manurial treatment of the soil are closely studied. The fruit should be allowed to colour as much as possible on the tree, but the ground colour must still be quite green when the apples are picked. Immediate cool storage is beneficial, as this ensures the fresh appearance and crisp, firm texture of the fruit after a long period in cool storage.



Typical specimens of Jonathan apples affected by soft scald. This effect usually begins to show up in cool storage about the last week in May, and continues to develop in the fruit until the end of July.

Late autumn spotting is one of the causes of loss with Jonathan.

Much is being done to minimize losses by a closer study of seasonal conditions, and by applying the cooling slowly in the initial stages of the cool-storage life of the variety to check any injury to an unnatural flesh condition of the fruit that has resulted from a too rapid growth because of unfavourable season or manurial or other conditions. By this means a control of the breakdown tendency in Jonathan apples, such as soft scald and flesh collapse, may be achieved.

The accompanying photograph shows the effect of soft scald as it appears in the Jonathan variety.

—A. Powell, Cool Storage Officer, Wellington.

Tobacco Notes.

Completion of Harvesting Season.

THE tobacco harvest in the Nelson District is now complete. It has been a most unusual growing season, as the crop has had no rain since the New Year. This dry weather has caused a reduction in the weight of cured tobacco per acre, although the exact figures will not be available until the tobacco has been graded and delivered to the various manufacturers. It is a fair estimate that the crop will be from 25 per cent. to 30 per cent. less than that harvested from the same acreage last year. The leaf is thinner and of finer texture, and more leaves go to the pound weight.

The compensating factor is that the colours are good, as, after the ripening of the leaf began, it continued evenly throughout the season right up the plant. Heavy rainfall during the picking-period would have materially increased the weight of leaf, but it causes a secondary growth which recharges the internal cells in the leaf and is visible by the colour of the plant changing from a light-yellow tint to dark green. If this happens several times during harvest the crop is more difficult to flue-cure and the colours respond to lower grades.

In certain localities the variety "Warne" has caused trouble to some of the experienced growers, as the dryness of the growing season has had a detrimental effect upon this variety, and only those growers who have irrigation plants have been able to secure good bright-yellow colours. When grown in a dry season "Warne" has a tendency to "break-down" or turn brown when the temperature of 100 degrees at the yellowing stage is raised to the fixing temperature of 115 degrees. It is during this period, which occupies from eight to ten hours, that the trouble is experienced.

A seed-germination test in progress.

Tobacco-seed.

A certain amount of tobacco-seed had been saved by this Department from selected New-Zealand-grown plants of the export varieties "Harrison's Special," "Warne," and "Bonanza." These seeding plants have flowered under muslin and, protected from cross fertilization, are pure to name. The seed is now being tested for germination.

It may be of interest to readers to describe the method and equipment we have used successfully for a number of years. It is useful to test any small seeds.

The articles required are one opaque electric-light shade, one enamel saucer, and some white blotting-paper.

Fill the saucer with warm water and place the small round hole of the glass shade in the centre of the water. Cut the blotting-paper into strips 8 in. by 2 in., fold the strips of blotting-paper lengthwise down the middle to form a V-shaped trough, and spread the seeds singly along the crease.

Press tightly and pin the ends, and then lay the strips with the name marked on the side with one end in the water and the other end protruding over the top of the glass about 1 in. for easy handling. Nine strips make a load, and they should be placed like the spokes of a wheel. Place the assembly on the kitchen mantle or on the plate-rack over the stove. The capillary action and evaporation will keep the seeds warm and damp, and tobacco-seeds respond to this in five to six days according to the heat.

We usually make three strips each of one hundred seeds for each variety, and average the totals. These strips are very easily examined, and with a magnifying glass the sprouted seeds are easily counted and the percentage noted.

—*Charles Lowe, Tobacco Instructor, Motueka.*

Viticulture.

Phylloxera-resistant Stocks.

(Continued from April issue.)

THE Berlandieri x *Riparia* (420·A Millard and Grasset) stock was introduced into New Zealand in 1904, but it was evidently considered of less value than the Rupestris du Lot and the Mouvedre x *Rupestris* 1202, which were used, especially the latter, extensively for grafting both table and wine varieties on for outdoor cultivation.

Although Signor Romeo Bragato in 1906 mentions the 420·A in his "Viticulture in New Zealand," when quoting Racah he does not recommend its use in New Zealand, probably because of its relatively poorer initial growth. However, the fact remains that the 420·A was used with other stocks in the establishment of several of the small vineyards

planted from 1909 onwards in the orchards established by the Government near the Waerenga Experimental Station (now Te Kauwhata Horticultural Station).

The writer's attention was called by the owners of some of these small vineyards to the superior crops of grapes—superior both in quality and quantity—on certain rows of vines in blocks of the same variety. Suckers were obtained from the stock roots and propagated, and it was found that the suckers from three vineyards out of four turned out to be the Berlandieri x *Riparia* 420·A, and the fourth the *Riparia* x *Rupestris* 3306. All these vineyards are planted on a heavy tenacious clay with very little natural top-soil.

The 420·A has since been tried out in New Zealand as a stock for a number of varieties of vines and under varying soil conditions both outdoor and under glass, and has given general satisfaction to the growers who have tried it. Some speak very highly of it. This is not surprising, as it is well spoken of in most countries where it has been tried out.

Dr. Perold, Professor of Viticulture and Oenology at the University of Stellenbosch, South Africa, in his "Treatise of Viticulture," writes: "I consider it to be one of the best all-round stocks," and Mr. F. de Castella, Government Viticulturist, writing in the journal of the Department of Agriculture of Victoria, states: "It has recently (1921) come right to the front as regards popularity, especially for field grafting. Every one who has tried it speaks enthusiastically of it. Though growing rather less vigorously than some other stocks the first year, it soon makes up for its slow start, especially when grafted."

The 420·A seems to do well on most well-drained soils in New Zealand, and is said to tolerate up to 40 per cent. of lime. In the Government vineyard it is showing dark-green foliage and vigorous growth after the driest growing season experienced for many years.

The principal characteristics are: Thick trunk, rods vigorous and spreading; bark greyish brown; young growths long with few sub-laterals, internodes long, cylindrical, shiny chestnut brown, with nodes not very prominent. In the herbaceous state the colour is light green with the upper part of the nodes wine coloured, a character peculiar to the 420·A.

The leaves, thick and leathery like the Berlandieri, are round, the lobes being marked by longer teeth, recalling its *Riparia* parent. The *Sinus petiola* is deep of a U or V form. The surface of the leaves is smooth or slightly undulating, forming a gutter along the principal nerve; dark green on the upper surface, and lighter underneath. The nerves are strong and wine coloured at the base; teeth in two series, obtuse, not prominent. The petiole is short, strong, and round, and slightly violet.

—J. C. Woodfin, Vine and Wine Instructor, Te Kauwhata.

(To be continued.)

Preparation of Cuttings for Striking.

M. R. R. H. (Marton):—

Could you supply me with information by means of your *Journal* about the general theory of the selection and preparation of cuttings for striking? I am given to understand that almost any tree or shrub can be propagated by cuttings if rightly done. I am interested in finding out how, as I wish to plant a waste corner.

Horticulture Division:—

To say that almost any tree or shrub can be propagated by cuttings if rightly done is something of an exaggeration, as much depends on the climate of the locality where the work is done. Much can be done in the humid districts that would not be possible in the drier.

The general theory in propagating trees and shrubs by means of cuttings is to select new wood just as it reaches maturity choosing firm, well-grown wood and avoiding that which is undersized or of soft rank growth. With a very sharp knife cuttings are made up to about 10 in. long, the length depending very much on the thickness of the growth, the cut being made just below a bud at the base and just beyond a bud at the top. Where trouble is likely to arise from sucker growth the buds on the cutting are removed, with the exception of three or four at the top.

The cuttings are best planted in a moist sandy soil in a shaded position, two-thirds or three-quarters of the length being beneath the surface so that the cutting does not dry out before rooting takes place.

The Orchard and Garden Diseases Act Extension Order (No. 2) 1939 declares bulb aphis (*Aphis tulipae*) and dicky rice weevil (*Maleuterpes spinipes*) to be diseases within the meaning of the Orchard and Garden Diseases Act, 1928, and the First Schedule thereto is extended accordingly to include them.

—A. E. Morrison, Solicitor, Department of Agriculture.

SAFETY FOR YOURSELF! FOR YOUR FOLK!

Whether your travel is for business or pleasure, is it not worth while to be easy in mind on the question of safety? Does not the instinct of self-preservation urge you to take the safe way?

The safe way, night and day, is the railway. For the welfare of yourself and your folk, give good heed to the Railway Department's constant conscientious devotion to the principle of **"Safety First."** The permanent-way and the rolling-stock are under regular inspection by experts. If you think seriously, can you ignore the offer of your own railways to give you the cheapest and safest transport?

Your Railways constantly give new point to an old proverb:

"ALL'S WELL THAT ENDS WELL."

Vegetables, Small Fruits, and Flowers.

Contributed by the Horticulture Division.

Winter Pruning of Hardwood Plants.

PRUNING is done at different seasons with various objects, as, for instance, in early summer, when disbudding and shortening new wood is done to some extent with the object of directing the growth of a plant, or in late summer laterals may be shortened to encourage the formation of flower buds on trees which carry their blossoms on "spurs" on the old wood. At this winter period pruning is an important operation among deciduous trees and shrubs. Evergreens of that class are generally rather more tender, and are usually given this attention towards the end of winter or in early spring, especially when heavy cutting back is necessary.

Last month's notes closed with a description of pruning treatment suitable for most kinds of trees and shrubs when young and at the time of planting out—treatment which is of the greatest importance, as, if early training is neglected or is performed on the wrong lines, little can be done to improve it later.

Established Plants.

Trees and shrubs which are established and on their way to maturity should be carefully looked over at this season, and branches which are inclined to crowd too closely or cross the centre of the tree and chafe others should be removed entirely. The cut should be made close up and flush, using sharp tools so that it may be smooth, and dress with hot tar, paint, or bitumen emulsion all of the wounds of any size.

When this is done with care the frame of the plant is strengthened, enabling it to carry better a weight of fruit, if necessary, and withstand the force of high winds. It also admits light and air to all parts sufficient for the desired growth of buds and foliage.

A few plants which have soft, spongy wood with large vessels, such as the grapevine, are best pruned in a way which leaves a stub extending beyond the bud from which growth is desired. The following year, or when the stub is dead, it should be removed flush with the living wood. This is especially important on those rare occasions when cuts are made into the old wood.

Mature Plants.

Trees and shrubs which have reached maturity and from which flowers and fruits are expected are often pruned systematically each year at this season with a view to the abundant renewal of wood of the fruiting type. This attention is usually reserved for some of the more useful hybrids.

Hydrangeas and roses, which carry the bloom on new wood, have last season's growth thinned drastically by the complete removal of weak and crowded wood, and the remainder is shortened back to a few buds, the last of which points in an outward direction. It is from the ensuing new growth from these buds that next season's bloom is to be expected. Minor adjustments to this treatment will be required for certain varieties and for plants growing under certain conditions.

In localities where hard frosts may be expected during the spring late pruning is practised to delay new growth, thus avoiding injury to it from that cause. Hydrangeas in a sunny position, where summer bloom will get burnt, may be pruned hard and late so that the main flowering period will be deferred until the autumn, when the conditions are more favourable. Roses of the class known as *Pernetiana* (hybrids originating in the yellow Austrian brier) resent having the young wood much shortened back; instead, heavy thinning is practised, and only the unripened end is cut from the young wood. The effect is to induce strong new growth from the base of the plant.

Black Currants.

Black-currant bushes and gooseberries flower and fruit on last season's growth of wood, provided it is moderately vigorous and well ripened. When pruning plants of this class, weak wood and old wood is cut down to a bud at the base, from which new growth may be expected next season which will flower and fruit the following year.

Wistaria, *Actinidia chinensis* (Chinese gooseberry), and others flowering on spurs on old laterals merely require the elimination of any strong growth which may upset the design to which the plant is being trained and such attention as may be required to keep the spurs in vigorous condition, such as shortening them to a moderately strong wood bud with a view to attracting growth to that section. The study and practice of pruning is one of the main factors in the successful management of very many plants.

Making New Gardens or Altering Old Gardens.

WHERE new gardens are being made, or additions and alterations are being made to old ones, the preliminary work should be carried out as soon as possible as weather permits, so that ample time may be afforded for cleaning and consolidating the land before sowing grass-seeds and setting out trees and shrubs in August and September, which is about the limit of the "planting season" in most localities.

Attention to drainage and repairs of paths and roadway may now be given as required. Nothing about the homestead possibly contributes more to the appearance and efficient working of the place.

Preparing Land for Tomato Crops Under Glass.

WHERE annual crops of tomatoes are grown each season on the same land for some years it is not surprising that difficulties often arise. Many of them are due to cultural problems which may occur anywhere, but the more serious are due to the strong establishment of diseases and pests which find this crop a favourite host.

They are dealt with economically and effectively only by maintaining a high standard of cleanliness and observing a strict method of sanitation not only inside the houses, but outside in the vicinity—in the potting and tool sheds, and about the whole premises. It is only when this is done that one may expect satisfactory results from chemical remedies. There is no successful grower over a long period who has not carried out these principles rigorously.

In some of the warmer districts the crop in the unheated glasshouse is planted towards the end of July, but more often planting out under such conditions is done towards the end of August, and that is usually soon enough. The cultivation of the land and the fertilizers applied are usually satisfactory, but the maintenance of a supply of humus and the application of sufficient water are very commonly neglected.

Crop Diseases.

The diseases in the crop, resulting from the excessive use of stable manure in the past, led to the present fairly common state of a shortage of humus where the soil readily becomes dry and dusty and lacks that active bacterial action which one recognizes as a characteristic of fertility. In a light soil with an open subsoil considerable amounts of organic matter are required to maintain that condition. With a higher water-table and a heavier soil humus is consumed less rapidly.

As land under glass does not receive the advantage of winter rains it is important to supply that deficiency by thoroughly wetting soil and subsoil three or four weeks before planting takes place. More than one application may be necessary to do this properly, but it is important it should be done and that the land should be allowed to warm up to a temperature of about 55° F. before planting is begun. Not much watering will then be required during the difficult spring-time period, and steady growth is less likely to be impeded.

Raising Seedlings.

Tomato-seed for planting out under glass towards the end of August should be sown now, and another sowing should be made in August for planting outside towards the end of October. To hold over surplus plants from the first sowing for outside planting at the date mentioned is unsatisfactory, as the plants will be stale and stunted, and cropping retarded as a result. A satisfactory compost, sufficient heat, and close attention to ventilation are the main requirements to obtain good plants, although ample light should by no means be forgotten after germination has taken place.

Where the compost is sterilized, turning and mixing is usually quite well done before filling the boxes. In other cases this necessary preparation is often neglected. Seedling weeds are destroyed by turning a heap of compost as soon as they germinate, and successive crops of weeds are destroyed in a similar manner. In addition, the ingredients are well mixed. Not only the weeds, but also fungi and insects, are destroyed by these operations, and the chemical condition of the compost is improved.

A suitable temperature for raising these seedlings is 60° F., with a limit either way of 55° and 65° F. They are raised in a propagating-house heated by means of hot water or electric cable, on a hotbed of composted stable manure in a glasshouse, or, later on, outside in a warm sheltered position. Or the frame, in a glasshouse, is heated by means of oil-burners. The young plants must be watered sparingly with tepid water, but should never be allowed to become dry.

Ventilation should be given on all suitable occasions. This, perhaps, is the most difficult requirement because of the demands on one's time at a busy season of the year, but it is fundamental to success and will save much work and anxiety later. Diseases indirectly caused by overheating and chilling plants are probably the most common source of trouble in growing this crop.

Attention to Produce in Stores.

POTATOES, onions, pumpkins, &c., in storage should be examined at fairly close intervals at the beginning of the storage season to see that all is well and to get early intimation if deterioration is going to occur.

Suitable varieties well cured and free from disease should not give much trouble for storage without loss in a shed in which the temperature is fairly even and free from violent fluctuations. Produce of less-reliable quality will require close supervision, but in either case good ventilation, whenever it can be done without resulting in extreme temperatures, will lengthen the storage period so long as possible. This is most important during the early part of the storage period.

Preparing Land for Cropping Outside.

FOR planting early crops in July, and asparagus, rhubarb, &c., during August, the preparation of the land should be continued during mild, dry weather.

In many districts such conditions are rare at this season, and every advantage must be taken of the periods when they do occur. Cultivating the land when it is frosted or wet is bound to cause trouble, and in most cases it will be serious.

Slugs and Snails Do Most Damage in the Spring.

IN summer when growth is plentiful the browsing of slugs and snails is not so serious as during winter and early spring, when the plants are small. They may then do extensive damage in a very short time if not checked.

Bluestone (copper sulphate) in any form and in the smallest quantities is intolerable to these creatures, and dehydrated and mixed with lime hydrate (slaked lime) at the rate of one part to ten and thinly distributed with a "duster" it is very effective. Or it may be finely ground and mixed with Kainit at the rate of one part to twenty and distributed at the rate of 1 oz. per square yard. These should be applied before planting. Further, these pests will not touch anything which has been sprayed with Bordeaux.

Alum is also an effective slugicide. In solution or distributed thinly as a powder it may be used freely among growing plants without damaging them. A new and effective remedy is "Meta." One stick finely ground and mixed with a quart of bran and distributed thinly is a popular "remedy" in Europe just at present. For larger quantities a 1-per-cent. mixture by weight will be found effective.

At night in warm humid weather these creatures are most active, and treatments, generally, are best given then or during the afternoon preceding such periods.

—Wm. C. Hyde, Horticulturist, Wellington.

Work for the Month in the Apiary.

Preparations for Winter.

IN most districts throughout the Dominion all surplus honey will have been removed from the hives and extracted, so that all that now remains is to market the honey and prepare to safeguard the colonies for the winter months. Unfortunately, the honey crops throughout the country have been exceptionally light, but beekeepers would be well advised to look forward to the future by assuring that each colony is left sufficient stores to cover the winter and early spring months.

Those who have been fortunate enough to secure a crop, even though it be small, should endeavour to spare as much of their surplus as possible for the Internal Marketing Division, for it is only by maintaining supplies through this channel that the future can be safeguarded.

Uniting Weak Colonies.

While examining colonies to ascertain their winter requirements a note should be taken of any colony that is weak in numbers. Where such is found, this colony should be united to another in order to ensure that all go into winter quarters as strong as possible. To attempt to save a weak colony as a separate unit at this time of the year would almost certainly result in its loss. Two weak colonies, if united, will often make a fair average hive, which, with sufficient stores, would have every chance of surviving.

In uniting such colonies, it is advisable to kill the queen in one of the hives beforehand (destroying the inferior queen if there is any difference). Then, at night, remove the lid and mat of the hive with the queen, placing a sheet of newspaper over the frames. Next remove the queenless colony from its stand and quietly place it over the paper-covered hive. In a few days the bees will have perforated the paper and quietly amalgamated.

Good Brood Combs.

A mistake often made by beginners and careless beekeepers is to fail to examine the bottom-brood chamber. Sometimes it is found that combs have become broken and warped and that a quantity of drone cells are among the brood combs. Such neglect of the combs is detrimental to the welfare of the colony, as, in the spring, when brood-rearing begins, the bees are handicapped by insufficient space to rear larger quantities of worker brood.

Before finally closing down for the winter the bottom box should contain all good combs of worker cells, well filled with honey, and with a certain amount of pollen. Any inferior combs should be removed, and, if containing some honey or brood, they could be placed in a super over the mat and a small hole cut in the mat to allow the bees to gain access to this super. They will then remove any surplus honey in a week or so. These combs can be removed when empty and put aside for further attention.

Later, when opportunity offers, they may be "patched" by cutting out all inferior combs and replacing them with pieces of good comb obtained from other rejected combs. For instance, it is often possible to make one good frame of comb from two inferior frames. This is done by cutting out the drone comb from one frame, cutting a corresponding piece from the other comb, and then fitting it in closely and securing it by two or three rubber bands. These bands can be made by cutting rings from an old motor-tube. In the spring the bees will readily join this, when the bands can be removed.

Sufficient Stores.

In regard to the quantity of honey that should be left for winter use, it is generally conceded that from 30 lb. to 40 lb. of honey is necessary, much depending on the locality and early spring nectar. Fuller details in this respect can be gained by studying last month's notes in the *Journal*.

Care of Spare Combs.

Perhaps the beekeeper's greatest asset is his spare drawn combs, so that every care should be taken to ensure their being safe from vermin throughout the winter and from wax-moth in the spring.

The ideal method is to have an airtight room or large cupboard in the honey-house fitted with racks on which the combs can hang. These can be fumigated occasionally with sulphur fumes or calcium cyanide to kill off any wax-moths or other vermin.

However, where such an apartment is not available the frames can be placed in supers and tiered up, placing a queen-excluder under the bottom one and over the top one to keep out the mice. A few carbon balls placed in each super will assist in keeping out the moth. As soon as warmer weather prevails they should be examined occasionally, and if any moths are noticed they must be fumigated.

There is, however, little danger in the colder parts, but in the northern districts the moth can be destructive all the year round.

Feeding for Winter Stores.

Where it is found necessary to supplement the supply of winter stores, and where no spare frames of honey are available it will be necessary to resort to sugar feeding. Only the first quality should be used. Feeding for this purpose should be done as soon as possible before closing down for the season.

The strength should not be less than two parts of sugar to one of water, and the feeding should be so done that the bees can take it up quickly and store it in the combs. Every precaution should be taken to avoid setting up robbing, and to avoid this the feeding should be done in the evening, making sure that none of the syrup is spilt around the hive.

For rapid feeding the container for the syrup should be large enough to hold about 2 quarts or more of the syrup. The feeder is placed in a super above the brood box but over the mat, and a corner of the mat is turned back or a hole made in it to allow the bees access to the feed. When they have taken up sufficient to last them until spring this super and feeder should be removed and one or two heavy mats placed over the frames to keep the bees as warm as possible.

—G. V. Westbrooke, Apiary Instructor. Hastings.

Poultry-keeping Section.

Details of Wallaceville Colony Houses.

SEVERAL inquiries have been received for particulars of the construction of the movable colony houses in use at Wallaceville Poultry Station. The two photographs in this issue will give a good idea of these houses, which are constructed as follows :—

The foundation consists of two 5 in. by 3 in. Jarrah runners 14 ft. long, to which the floor joists of 4 in. by 2 in. are bolted. There are seven of these spaced at 22 in. centres, the runners being 4 ft. apart.

The overall length of the colony house is 10 ft. 6 in., the width 6 ft., the height at rear 5 ft. 5 in., and the height in front 6 ft. 5 in. All the framework is constructed of 3 in. by 2 in., except floor-joists. The studs are spaced at 23 in. centres, of which there are five on either side, three at the back, and three in front. Two rows of dwangs are cut in between the studs and are braced either way, the bracings also being of 3 in. by 2 in. The rafters, of which there are three, are spaced at 3 ft. centres, one on either side and one in the middle. The floor is of 6 in. by 1 in. T.G.

The roof has purlins of 6 in. by 1 in. spaced to suit the iron, on which, firstly, wire-netting is drawn tight, then the building-paper, and lastly the iron, of which there are six 7 ft. strips. The walls outside are also covered with corrugated iron, of which there are three 5 ft., ten 7 ft., and four 6 ft. strips. The 5 ft. strips are for the back, and the remaining space between the top plate and top of iron is covered with sparrow-proof netting.

The door is placed in the front on the left-hand side, and is half T.G. 6 in. by 1 in. and half netting, sparrow-proof. The upper 3 ft. of the front of the house is open and protected by wire netting. The barge and cover boards are 6 in. by 1 in.

Rain-water from the roof is collected in a barrel on a platform at the back of the house.

About 120 chickens seven to eight weeks old are placed in each colony house, and this number is gradually reduced to between 60 and 70 by the time the birds are fit to return to their laying-houses.

The great advantage of the use of colony houses are that they can be moved to fresh ground, that young growing stock have free range, and that moulting hens can be given a change while their laying-houses are being cleaned up.

INTERNAL AND EXTERNAL PARASITES.

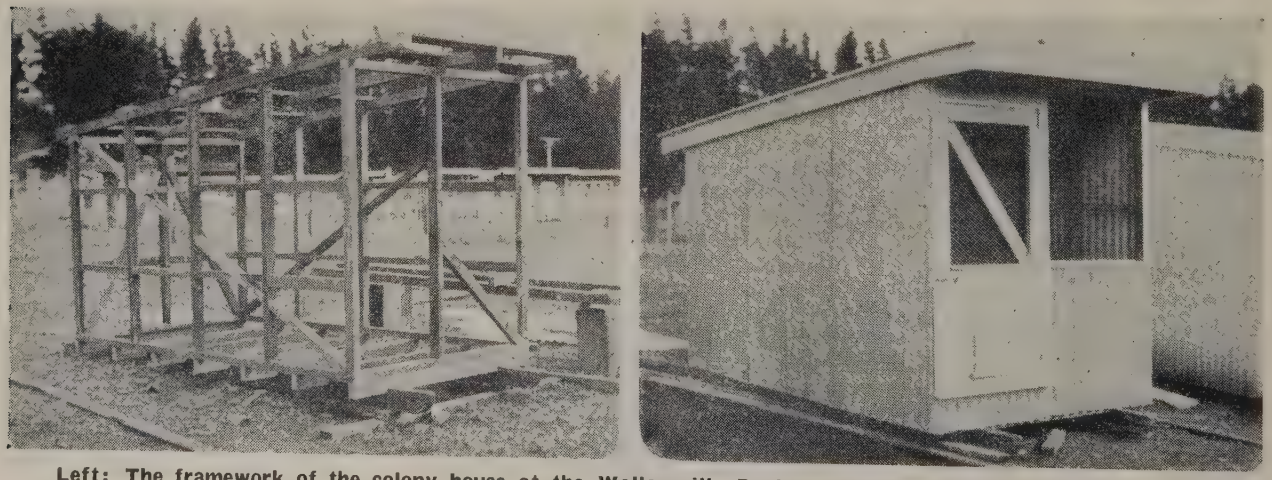
(Continued from April issue.)

FEW birds or plants are free from all parasites, and if birds are to be kept under hygienic conditions a constant fight must be kept up against parasites. As recent notes dealt with poultry parasites there is no need to go further into the question here.

Hospital Pen.

A hospital pen or coop is a necessary part of the equipment of a well-managed poultry plant, and as soon as a bird shows symptoms of sickness it should be removed from the flock for observation and treatment if considered advisable.

The disposal of dead birds is a very important matter. Nothing is more dangerous and likely to spread disease than to leave dead birds lying about or to throw them on manure-heaps. The best means of disposal is by burning, but if this is not possible they should be buried deeply in the ground so that the carcass is not likely to be dug up by dogs.



Left: The framework of the colony house at the Wallaceville Poultry Station. Right: The completed house.

Cleaning a Poultry House.

ALL poultry-houses and coops should be given a thorough cleaning and disinfecting at least once a year. However, because of the fact that many poultry-keepers have only one fowlhouse, it is not always possible to do this work as thoroughly as it should be done. The poultry-farmer would be wise to manage his plant in such a way that all houses can be properly cleaned and disinfected each year, especially those keeping birds on the intensive system.

To do this work properly the first thing is to remove all nests, perches, grit-boxes, &c., then all litter, and, if the house has an earthen floor, all loose earth should be taken out. The ceiling, walls, and floor should then be given a good sweeping with a stiff brush, and the accumulated dirt removed. Then take a spray pump or garden hose and wash down the ceiling, walls, and floor. Use plenty of water. After this has been done scrape all perches and roosting-boards and remove any caked manure.

It is advisable to allow the house a day or two in which to dry, and then to give the whole house, ceiling, walls, floor, perches, nests, &c., a good spraying with a strong disinfectant, making sure that the disinfectant gets into all corners, cracks, and crevices. A second spraying with disinfectant will be well worth while.

A similar thorough cleaning should be given to all brood coops, brooder houses, and colony houses, and this should be done well before the breeding-season.

Annual Overhaul.

It is a really good plan, also, to make a practice of giving the whole poultry plant a really good overhaul once each year, and this should be done before the busy hatching season starts. Now is a good time to examine all fences, posts, gates, doors, troughs, nest-boxes, brooders, incubators, &c.

A new post, a fresh piece of wire-netting, or a little timely attention to a badly-fitting gate or door will save extra expense and perhaps annoyance later on and add greatly to the general appearance of the plant. An extra feed trough is an asset on any farm. It is well to see that sufficient troughs are provided so that each adult bird is allowed 3 in. trough feeding-space.

Show Season.

THE show season will soon be with us again, and it is well to bear in mind that shows continue to play a very important part in the development of the poultry industry. In the past

The 3D. Egg Is Here!

The MORE you get, the BIGGER the PROFIT!

POULTRYKEEPERS—with eggs fetching over 3/- per dozen retail (3d. each), every bird *MUST* be made to contribute its full quota to the egg basket. Otherwise, every egg you fail to get represents a serious loss. CONSIDER THIS—if you have ten birds averaging only 3 eggs each per week, when they *COULD* be averaging 5, your weekly loss is approximately 5/-. On 50 birds you lose over 20/-. And bear in mind that your food bills cost you just the same.

Make sure, therefore, that your birds are laying every egg of which they are capable. HOW? By feeding them their natural stimulant (*ground insects*), in the shape of Karswood Poultry Spice. The cost is only two farthings per day for every 10 birds—3½d. per week. So that if your birds lay at least one extra egg per bird per week (which they should easily do)—with eggs at 3d. each—this small investment comes back to you *EIGHT TIMES OVER IN EXTRA PROFIT.* Start Karswood this very week. Read these experiences:—

OVER 5 EGGS PER BIRD PER WEEK FROM 50 HENS.

"I have to thank you for the wonderful results I have obtained by using your Karswood Poultry Spice—especially as an egg-producer.

All hens, both young and old, are looking most healthy and never in the months after the moult did I receive such a large number and uniform size of first-grade eggs. I keep 50 birds, heavy breeds, as surrounding my poultry houses is clay soil. By using Karswood Poultry Spice, I receive daily about 40 eggs, which I think is very good.

I advise all poultrykeepers to use Karswood Poultry Spice for egg-producing and healthy stock."—G. G.

TWICE AS MANY EGGS FROM 800 BIRDS.

"Recently I started using Karswood on 400 second-year hens and 400 pullets. Egg-production before using it was between 20 and 30 per cent. (160 to 240 eggs approx.). Up to date I have used ½ cwt. of Karswood with this particular 800, and the birds have doubled their egg-production even under the appalling weather conditions of this winter. Karswood is certainly a wonderful tonic and egg-producer, and any money spent on it can be regarded as a positive guarantee of a full egg basket. My advice to any poultrykeeper is—if you wish to insure your egg farm—give Karswood Spice to your birds."—C.B.S.

(Original letters on file for inspection)

¼D. A DAY FOR EVERY FIVE HENS IS ALL IT COSTS YOU

1/- packet of Karswood supplies 20 hens for 16 days; 2/- packet supplies 40 hens for 16 days; 7 lb. tin (12/6) supplies 280 hens for 16 days. Try a shilling packet.

KARSWOOD POULTRY SPICE

Increases egg-production without forcing, because it contains ground insects, but no cayenne pepper, &c.

rather much preference was given to fancy points and not sufficient to the utility characteristics, and several breeds were more or less spoilt from an egg-laying point of view. However, poultry shows and egg-laying competitions, if judged to a proper standard, are capable of doing much good if only by compelling competitors to pay more attention to those characteristics which distinguish one breed from another.

Unfortunately, a number of utility-poultry keepers do not pay sufficient attention to what may be termed real breed characteristics, with the result that it is not uncommon to see large flocks of Orpingtons and Leghorns that have lost much type and many breed characteristics.

A show is the place where the breeder can display his or her ability to breed good standard stock. It is the place where one can see where they are strong or weak, and where one can learn where to improve if the top is to be reached. Shows are the means of creating keen, friendly rivalry, thus increasing interest and knowledge in breeding.

For these reasons utility-poultry keepers are advised to support their local poultry show and, if at all possible, make an entry. It is surprising how much can be learned and how much pleasure a keen novice can obtain from an entry at a show.

One should not be discouraged if not successful at first. It is a good idea to contact the judge and get his advice. Most judges are only too pleased to help; in fact, any fancier or show official is usually keen to encourage the beginner.

Even if an entry cannot be made it is a good spirit to encourage officials by your presence at a local show.

—C. J. C. Cussen, Chief Poultry Instructor, Wellington.

Market Gardens.

The following figures give an indication of the extent of the market-gardening industry in New Zealand :—

	£
Acreage occupied by market gardens ..	7,795
Value of land under cultivation ..	779,500
Working capital invested including glass-houses	400,000
Approximate value of market-garden produce including tomatoes (probably conservative)	2,250,000
Annual value of wages paid by agreement under Agricultural Workers Act	20,000
Annual value of fertilizers used ..	40,000
Annual value of railway freights ..	50,000
Annual value of tomato-cases ..	25,000
Annual value of spraying and dusting materials and machines	5,000
	£3,569,500

Petrol, oil, and motor repairs are not obtainable.

—D. K. Pritchard, Assistant Horticulturist, Wellington.

Slaughterings of Stock.

THE following return of slaughterings of stock at meat-export slaughterhouses and abattoirs for the eleven months, May, 1938, to March, 1939, inclusive, has been compiled by the Live-stock Division :—

District.	Cattle.	Calves.	Sheep.	Of which Ewes.	Lambs.	Pigs.
North Island.						
Meat-export slaughterhouses—						
Auckland	132,822	556,144	384,511	212,184	881,127	354,988
Poverty Bay - Hawke's Bay ..	39,765	39,626	682,439	251,702	1,290,015	36,511
Taranaki-Manawatu	74,448	237,422	471,487	210,013	1,344,872	203,901
Wellington-Wairarapa ..	29,238	26,453	522,030	181,758	1,006,386	46,444
Totals	276,273	859,645	2,060,467	855,657	4,522,400	641,844
Abattoirs	106,725	34,638	347,420	200,497	61,401	104,938
North Island Totals ..	382,998	894,283	2,407,887	1,056,154	4,583,801	746,782
South Island.						
Meat-export slaughterhouses—						
Nelson-Marlborough	292	10,549	35,649	8,664	189,335	13,051
Canterbury	12,077	40,680	548,035	416,325	2,292,910	39,856
Otago-Southland	7,117	44,384	315,875	254,578	1,763,790	5,298
Totals	19,486	95,613	899,559	679,567	4,246,035	58,205
Abattoirs	52,902	13,513	244,513	120,865	38,590	25,642
South Island Totals ..	72,388	109,126	1,144,072	800,432	4,284,985	83,847
Dominion.						
Meat-export slaughterhouses ..	295,759	955,258	2,960,026	1,535,224	8,768,435	700,049
Abattoirs	159,627	48,151	591,933	321,362	100,351	130,580
Grand Totals	455,386	1,003,409	3,551,959	1,856,586	8,868,786	830,629
Same period, 1937–38 : Meat-export slaughterhouses and abattoirs	449,586	1,052,879	2,733,891	1,379,766	8,841,588	905,347
Same period, 1936–37 : Meat-export slaughterhouses and abattoirs	362,341	1,032,865	2,172,240	1,134,958	8,179,237	836,033

DEPARTMENT OF AGRICULTURE.

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For full particulars apply—
The Poultry Overseer,
Veterinary Laboratory,
Private Bag to Wallaceville,
WELLINGTON.

N.Z. Federation of Young Farmers' Clubs.

Edited by S. Freeman, Dominion Organizing Secretary.

A Challenge to Young Farmers.

The following circular was prepared by Mr. N. Lamont, District Y.F.C. Secretary, Masterton, and forwarded to all clubs in the Wairarapa district. As it is of general interest and application it is considered that it will serve a valuable purpose to publish it in these pages.—*Editor.*

I THINK there will be few of you who will not agree that there are many ways in which your club and your club's work can be improved. All of you, too, are keen to " do something," but in many cases you are at a loss to know just where to start.

I want you to understand clearly that in my position as District Secretary it is my job solely to carry out the directions of the District Executive, and it is neither my place nor my wish to be dictatorial in regard to your activities or the manner in which you conduct your affairs. Indeed, it is my firm conviction that any attempt on my part, or on any one else's, to " run " the movement would be definitely opposed to the best interests of the movement and would quickly bring about its collapse.

You and your fellow-members are the Young Farmers' Club Movement; it is for you to direct and control the organization, to formulate its policy, to conduct its activities, and to decide its fate.

Attaining the Ideals.

Frankly, what impression do you get when you critically examine your own club and its activities. To what real extent are you and your club attaining the ideals of the organization—ideals which were of a quality that launched the movement with a vigour that few other movements can boast? Many of you in some respects can view with legitimate pride the work you have done and the club you have established—and yet—are any of you wholly satisfied?

I want you to regard this not as an official " blast "—far from it, because I am writing in a very different spirit—but rather as a personal letter in which I will try to incorporate all I have discussed with you individually in the past few months and which may be of value to you, who are the leaders of your club and who are genuinely concerned with the welfare of your club and the movement as a whole.

You all know as well as I do that there were innumerable gloomy prophets who said, and still say, that the Young Farmers' Clubs would be just one of those " flash in the pan " movements, and that it would die a natural death after a few years when the early enthusiasms wore off.

Critical Stage.

It is no use mincing matters; we have to-day reached just that position in the Wairarapa. We hold the proud position of being the first district in the North Island to organize, and we have given a lead in innumerable directions with highly successful activities, such as camps, judging competitions, &c. Now we are the first to reach the critical stage in our history when the first flash of enthusiasm for a new idea has faded. Now what?

Actually, from a district point of view the position is, on the surface, very satisfactory. Although one or two clubs are small, membership is generally being maintained. Attendances are small, but rarely insufficient for successful meetings. Field-days are being held and are fairly well supported. The same applies to district activities, such as tours, &c. On the surface we see the Young Farmers' Club movement as a very useful community organization doing exceedingly valuable work and occupying considerable news space.

But—and I feel sure you will agree with me—there is below the surface something little better than stagnation. With possibly one or two exceptions, all clubs have this year been marking time. How many of you would care to prophesy that next year you will start with an increased membership and that next year your treasurer's job of collecting subscriptions will be easier?

Perhaps you think I am a pessimist—perhaps I should write you a letter to tell you how well the movement is progressing, what a fine thing it is for you young farmers, how fortunate you are to have the opportunity, and all the rest that you have heard so often.

Many have said to me that enthusiasm must be constantly stimulated or the movement will die, and that the leaders of the movement should be some kind of super-salesmen. This means that just as " high pressure " salesmanship makes people enthusiastic about goods they may not need, so should the Young Farmers' Club organizers make you enthusiastic about activities that appear useless to you.

Where the Weakness Lies.

On the contrary, if the Young Farmers' Club movement can survive only through continual artificial stimulation of the enthusiasms of members, then I personally would sooner see it die. But I believe firmly that the " goods " which the movement offers need no " sales talk "; they can sell themselves, providing we remember one thing: No goods, even though their quality be second to none, will sell themselves unless they are

properly displayed. You, as the club executives, are responsible for the manner in which the "goods" are displayed—in other words, for the manner in which your meetings are conducted and your activities organized—and frankly that is, in my opinion, where the present weakness of the movement lies, so far as the Wairarapa is concerned.

The novelty of the whole idea of the Young Farmers' Club movement, the attention it attracted from outsiders through the press, and the genuine appeal of the ideals established the organization and fanned a flame of enthusiasm that carried it irresistibly along to its present strong position in spite of inexperience, inefficiency, and ineffectuality on the part of members.

The ideals remain as potent as ever, but the early enthusiasm of novelty is waning, and it must be replaced by solidarity based on efficiency.

Improving Meetings.

I feel sure that a general improvement will result if executives realize how their meetings can be improved by vastly greater attention to a number of points which, although small in themselves, are in the aggregate highly important. Too often club executives who are concerned with failing interest and reduced attendances have discussed their problems with me in the hope that some "stunt" could be devised which would bring their members flocking back, but field-days and socials, although extremely useful, are alone quite inadequate. The same applies to district events. During the past two years there has been a flood of camps, weeks, judging competitions, tours, overseas trips, visitors from outside districts, and so on—all very desirable, but far from effective in establishing individual clubs on a sound basis.

Personally, I feel that rather too much attention has been focused on these more or less spectacular stunts to the exclusion of matters of greater importance. The movement cannot be built from the top of the foundations. The foundations of the organization are the individual clubs. While these are sound all other things will naturally develop.

I propose now to mention some of the points which have occurred to me in visiting clubs in this district. All that I have to say will not apply to all clubs, but some of it will apply to every club, and I hope you will seriously consider where my remarks apply to yourselves, as I feel sure that by attention to these small matters you will get results.

(1) Executive Meetings.

The majority of clubs appoint an executive, but few executives ever do anything. Too often, everything is left to the unfortunate secretary and perhaps one or two helpers. Club executives should meet regularly shortly before the monthly meetings and consider such items as the following:—

(*a*) All business coming up at the monthly meeting. Very often time is wasted at monthly meetings on business that is executive business.

(*b*) Executives should draw up tentative programmes for activities. For instance, if a field-day is to be held the executive should have a number of *complete* alternative plans prepared. They should have found a suitable day, a suitable place, and suitable demonstrators, stock, &c. Everything should be "cut and dried" so that it is only a matter of minutes for the full meeting to confirm the programme.

(*c*) The executive is responsible for finding lecturers, who should be booked weeks or months ahead instead of hours. Very few clubs have fully exploited the talent available to them. First decide on a subject you want, and then find the best lecturer on that subject within forty miles.

(*d*) See that some one is detailed to look after supper and firewood for the monthly meeting.

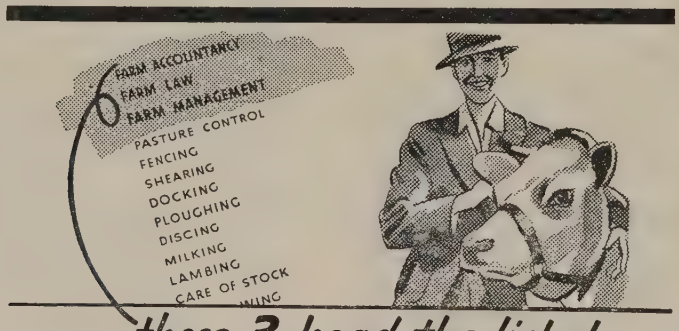
Members of the executive must realize that their positions mean something, and it is high time that they took their duties more seriously and really did some work.

(2) Monthly Meetings.

(*a*) Do not expect members to leave a warm fire to sit in a miserably bleak hall. See that the meeting-room is made as attractive as possible, and provide tea and biscuits.

(*b*) Cut out aimless arguments on matters that could be disposed of in a minute or two. This means that the chairman must be efficient, the secretary must provide a proper agenda paper, and the executive must be working properly. Above all, do not keep lecturers waiting for an hour while you wade through tedious business.

(*c*) Ordinary members should take more interest in meetings and lectures. Many clubs have a voluntary system in operation of short talks by members with the excellent object of encouraging them to have more to say at meetings. It would be much better if this were done from a list of members, so that it was *c mpulsory* for all to speak sooner or later. Such talks are the only way to make diffident members get on their feet.



these 3 head the list of
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..... J.A.

(3) Chairmen.

The majority of chairmen are to be highly complimented on the way they tackle their jobs without any previous experience, but many could watch small points.

(*a*) Remember that you have a dignified office to fill, and do not indulge in easy "back-chat" with argumentative members.

(*b*) Learn what you have to say in putting motions, &c., and say it loudly and decisively.

(*c*) Do not accept half-hearted "ayes" on motions, but insist on meetings expressing themselves properly.

(*d*) Do not permit argument among two or three members. Remember your position, and insist on all remarks being addressed to you.

(*e*) See that you are familiar with the business before the meeting so that you do not have to have conferences with your secretary in the midst of an item of business.

(*f*) See that a definite motion is before the meeting before any discussion takes place and cut short aimless discussions.

(*g*) Remember that the success and efficiency of the club depends more on you than on any other single member.

(4) Secretary.

(*a*) Provide your chairman with a proper agenda paper.

(*b*) Summarize all but highly important correspondence.

(*c*) Post notices of meetings in good time with the lecturer and subject clearly stated.

(*d*) In general, see that everything is at your chairman's hand and that he is kept fully acquainted with correspondence.

(5) Treasurer.

(*a*) It is your job to collect subscriptions. Keep a list of members, and see that the names of those who have not paid are read out at each meeting.

(*b*) See that you know something about book-keeping at the end of your term, even if you know nothing when you start.

(6) General.

Much more effectiveness, initiative, and vigour is necessary in the conducting of club affairs. Last summer we had a plague of insect pests. Not one club asked for any information on the subject or for a lecture until I suggested it. Perhaps some of you heard that more than £1,000,000 worth of stock were lost this year through facial eczema. How many clubs asked the veterinarian for a lecture on it?

Many of you must think I send out circulars for lack of something to do. You have little idea how rare or how welcome is any criticism or suggestions from clubs.

Do not forget that on your shoulders rests the fate of this movement. Do not expect to be persuaded and led all the time. It is your movement, for your benefit, and all that is done should be an expression of your will.

If the Young Farmers' Club Movement is worth while—and surely it is—then let the Wairarapa give a lead that will be much needed everywhere before long. Do not worry about spectacular stunts, but simply put your own house in order. Start now to make your club an efficient, self-reliant, effective unit.

Sports Meeting at Toko.

HUGH ANCELL, Chairman, Toko Young Farmers' Club.

A LARGE crowd gathered on 1st April to witness the first sports meeting conducted by the Toko Young Farmers' Club. The meeting was an outstanding success, and a large and varied programme of farming competitions was held, in which teams from Toko, Alton, and Karawaka took part.

During the afternoon Mr. Stan. Lay, New Zealand champion javelin-thrower, gave an interesting display.

Much credit is due to the young farmers for their organization, in which the Advisory President, Mr. L. Marfell, took a leading part. They were also assisted by the Women's Division and the Farmers' Union.

Each team consisted of four members, and went by colours. The Farmers' Union points trophies were awarded for the teams gaining most points in the competitions. The fencing contest was for a team to put in four posts to strained wires, points given for time, style, and efficiency. In the harness competition two members had to get a horse from stated place and harness and yoke it. The other two events were the pig-weight guessing and the chain-stepping.

Mr. Marfell donated a cup for the team gaining the most points in the above and in the 100 yards relay and tug-of-war.

Results of Competitions.

Mr. Marfell's Cup.—Toko (Blue), (H. Ancell, J. Jones, G. and B. Anderson), 1; Toko (White), (C. Rowe, W. Lister, J. Cook, and S. Carley), 2; Toko (Yellow), (P. and E. Jones, D. Harris, and C. Martin), 3.

Farmers' Union Trophies.—Blue, 1; White, 2; Yellow, 3.

Harness Contest.—Blue, 1; White, 2; Black (Karawaka), 3.

Fencing Competition.—Blue, 1; Yellow, 2; Black and White, equal 3.

Tug-of-War.—Blue team beat Black in final.

100 Yards.—C. Martin (Yellow), 1; B. Garlick (Green), 2; E. Jones (Yellow), 3.

Relay.—Yellow, 1; Green, 2; White, 3.

Chain-stepping.—White, 1; Blue, 2; Yellow, 3.

Weight-guessing.—White, 1; Blue, 2; Black, 3.

In the evening the trophies and prizes were presented at a dance. Mr. Hugh Ancell, Chairman of the Toko Young Farmers' Club, thanked all who had helped to make the day such a success, especially the members of the Women's Division, for their very helpful assistance.

Mr. A. Johnson, Chairman of the North Taranaki Executive, congratulated the club on its fine work. Mr. Blake, District Secretary, and Mr. Marfell, Advisory President, added their congratulations.

Mr. H. E. Blyde, President of the North Taranaki Farmers' Union, then presented the prizes won during the day. He also presented a cup donated by himself for a baconer-pig competition held at the New Plymouth Show and won by a Toko team comprising H. Ancell, J. Jones, and L. Kilsby. This, he said, reflected great credit on the winners, as more than forty teams had competed. In conclusion, he wished the clubs every success in the future.

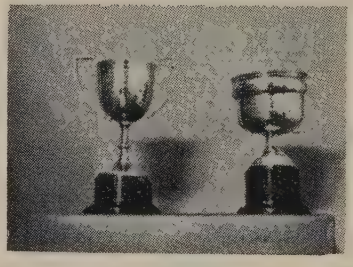
North Taranaki Stock-judging Competition.

Young farmers judging the Jersey cows.

THE North Taranaki Young Farmers' Clubs held a stock-judging competition at the Taranaki Agricultural and Pastoral Association's annual show on the New Plymouth Showgrounds on Saturday, 4th March. The occasion was the largest gathering of Y.F.C. members yet held in North Taranaki.

From ten clubs in the district and one in South Taranaki, no fewer than forty-two entries were received in each class, each club being represented, with more than one hundred individual competitors taking part. In addition to this, many of the members acted as stewards in the stock classes at the show.

Teams of three competitors were required to place in order of merit as suitable for export five bacon pigs, giving their reasons for so doing. Mr. J. Sorensen, Supervisor to the Taranaki District Pig Council, who acted as judge, then gave a demonstration on the pigs. A similar judging competition was conducted on pedigree Jersey cows, and a demonstration given by the judge, Mr. Wardlaw.



Left: The Hoskin Cup. Right: The Blyde Cup.

The following are the awards :—

Bacon-pig Judging.

(H. E. Blyde Cup and Certificates.)

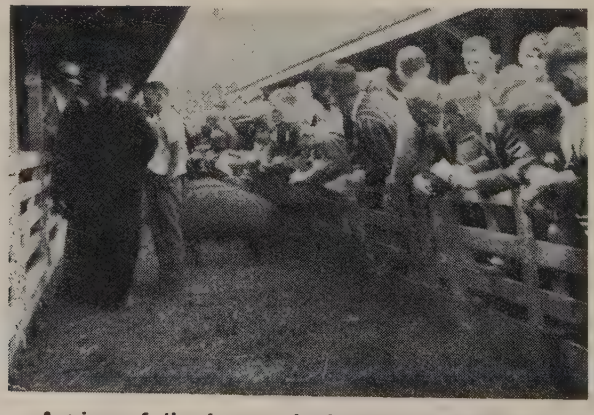
Toko B (L. Kilsby, J. Jones, H. Ancell)	1
Cardiff C (M. Belcher, F. Davidson, R. Morrison), and Cardiff D (C. Kemsley, J. Belcher, R. Belcher)	2
Mangorei (A. Johnson, L. West, C. Radford)	4

Dairy Cattle Judging.

(Cup donated by Mr. C. Hoskin, Bell Block.)

Okau-Tongaporutu (A. Jimmieson, B. Till, E. Foreman) ..	1
Cardiff (M. Belcher, F. Davidson, R. Morrison) and Hawera (J. W. Johnson, A. H. Johnson, G. Ogle)	2

Teams from the Okau-Tongaporutu, Hillsborough-Tarurutangi, and Mangorei clubs tied for third place.



A view of the bacon pig judging competitions.

Y.F.C. Personalities.

Mr. D. S. Ross.

MR. D. S. ROSS, Te Puke, Bay of Plenty, has been associated with the Young Farmers' Club movement since its inception in the Bay of Plenty District. He is Vice-President of the New Zealand Federation of Young Farmers' Clubs, Chairman of the Auckland Y.F.C. Council, Chairman of the Western Bay of Plenty District Y.F.C. Executive Committee, and Advisory President of the Te Puke Young Farmers' Club.

Mr. Ross is also a member of the Council of the Royal Agricultural Society of New Zealand, and a member of the Northern District Council. He is Immediate Past President of the Te Puke Agricultural and Pastoral Association, and a member of the Executive.

He is President of the Te Puke Boys' and Girls' Agricultural Clubs, having taken an interest in that movement for a number of years, and is also a member of the Executive Committee of the National Pig Industry Council, and President of the Bay of Plenty Pig Council.

Among the Clubs: Reports on Activities.

Western Southland.

(District Secretary: A. Stuart, Department of Agriculture, Invercargill.)

Dipton (Secretary: J. R. Palmer, Dipton).

Lochiel (Secretary: James S. Forbes, Invercargill-Otahuti R.D.).—Annual meeting. Officers elected: Advisory President, Mr. James Robb; Club Chairman, John Thomson; Secretary, James S. Forbes; Treasurer, R. D. Robb.

Thornbury (Secretary: K. E. McKenzie, Wright's Bush, R.D., Sec. 4).—Annual meeting. Officers elected: Advisory President, Mr. J. Linscott; Club Chairman, J. Beggs; Secretary, K. E. McKenzie; Treasurer, J. Ronald.

Woodlands (Secretary: L. Middlemiss, Woodlands).

Wyndham (Secretary: A. Howe, Box 40, Wyndham).—Annual meeting. Officers elected: Advisory President, Mr. E. Rabbidge; Club Chairman, F. Clay; Secretary and Treasurer, A. Howe. At a previous meeting a lecture was given by Mr. A. Davidson, Invercargill, on "Seeds and Seed Cleaning."

Eastern Southland.

(District Secretary: W. Faithful, Department of Agriculture, Gore.)

Balfour (Secretary: J. Orr, Balfour-Glenure R.D.).

Crookston (Secretary: D. Rea, Crookston R.D.).—Annual meeting. Officers elected: Advisory President, Mr. A. Pullar; Club Chairman, S. Ramsay; Secretary, D. Rea; Treasurer, L. Adam.

Five Rivers (Secretary: B. Selbie, Eyre Creek, Five Rivers).—Appointment of delegates to District Executive—viz., A. Rouse, G. Hamilton, and B. Selbie. Arrangements regarding visiting Nelson members. Account opened in P.O. savings-bank. Lecture by Mr. W. Faithful, Department of Agriculture, on "Seed Certification."

Maitland (Secretary: D. Smith, Benio R.D.).—The District Secretary, Mr. W. Faithful, discussed with members the Gore agricultural course and the projected tour of the North Island. A lecture was given by Mr. W. Pierson, Veterinarian, on "The Control of Parasites in Sheep." The speaker dealt with research work in the U.S.A. and Great Britain, and made recommendations regarding drenching, feeding, and treatment generally.

Moa Flat (Secretary: H. Love, Moa Flat, Heriot).—Annual meeting. Officers elected: Advisory President, Mr. G. M. Love; Club Chairman, N. Paul; Secretary, H. Love; Treasurer, A. McKenzie.

Otama (Secretary: L. G. Mackay, Otama R.D., Gore).—Annual meeting. Officers elected: Advisory President, Mr. D. Bruce; Club Chairman, W. Logan; Secretary, L. G. Mackay; Treasurer, K. Whyte. The programme of the three-day agricultural course at Gore was discussed.

Waikaka (Secretary: C. H. Kerse, Waikaka).—Annual meeting. Officers elected: Advisory President, Mr. H. A. Kerse; Club Chairman, A. J. Gardyne; Secretary and Treasurer, C. H. Kerse.

South Otago.

(District Secretary: A. F. Greenall, Department of Agriculture, Balclutha.)

Clinton (Secretary: F. G. Corbett, Ashley Downs, R.D., Clinton).

Lawrence (Secretary: R. T. Geeves, Waitahuna).—Annual meeting. Officers elected: Advisory President, Mr. R. McCaw; Club Chairman, W. McNoe; Secretary, R. Geeves; Treasurer, A. Cameron.

Milton (Secretary: D. Tweedie, care of Mr. D. Clark, sen., Moneymore R.D.).—Lantern lecture by Mr. D. S. Robinson, Department of Agriculture, on "Beekeeping."

Stirling (Secretary: Ron Anderson, Box 19, Stirling).

Central Otago.

(District Secretary: G. G. Calder, Department of Agriculture, Alexandra.)

Alexandra (Secretary: P. Weaver, "Earnscleugh," Alexandra).

Arrowtown (Secretary: R. W. Brown, "Islay," Lower Shotover).—Annual meeting. Officers elected: Advisory President, Mr. D. H. Cockburn; Club Chairman, C. J. Allen; Secretary, R. W. Brown; Treasurer, M. Hansen.

Manuherikia (Secretary: D. Armitage, Lauder R.D., Becks).

Roxburgh (Secretary: L. George, Roxburgh).—Annual meeting. Officers elected: Advisory President, Mr. R. T. Kinaston; Club Chairman, L. Henderson; Secretary and Treasurer, L. George.

Upper Clutha (Secretary: T. G. Anderson, Box 13, Mount Barker, Pembroke).—Annual meeting. Officers elected: Advisory President, Mr. W. A. Scaife; Club Chairman, W. A. Kane; Secretary, T. G. Anderson; Treasurer, B. Kane.

Dunedin.

(District Secretary: S. H. Saxby, Department of Agriculture, Dunedin.)

Middlemarch (Secretary: James Howell, "Stonehurst," Middlemarch).

Palmerston South (Secretary: N. Hitchcock, Palmerston South).—Annual meeting. Officers elected: Advisory President, Mr. J. Clearwater; Club Chairman, D. Clearwater; Secretary, N. Hitchcock; Treasurer, K. Hitchcock.

South Taieri (Secretary: A. M. McKenzie, Berwick).—Annual meeting. Officers elected: Advisory President, Mr. R. G. Steill; Club Chairman, J. Hamilton; Secretary and Treasurer, A. M. McKenzie.

West Taieri (Secretary, D. J. Doherty, West Taieri).

North Otago.

(District Secretary: T. A. Sellwood, Department of Agriculture, Oamaru.)

Duntroon (Secretary: A. Francis, Duntroon).

Enfield (Secretary: D. S. Anderson, care of Mr. W. Malcolm, Section 4AD, Enfield, R.D.).—Annual meeting. Officers elected: Advisory President, Mr. G. Yuille; Club Chairman, J. A. Porteous; Secretary and Treasurer, D. S. Anderson).

Five Forks (Secretary: W. J. Kingan, 15D, R.D., Oamaru).

Hampden (Secretary: R. Dowthwaite, care of Post-office, Hampden).

Papakaio (Secretary: J. S. Gibson, Papakaio).—Annual meeting. Officers elected: Advisory President, Mr. D. Borrie; Club Chairman, D. H. Borrie; Secretary, J. S. Gibson; Treasurer, J. Borrie.

Tokorahi (Secretary: T. McLean, Island Cliff).—Annual meeting. Officers elected: Advisory President, Mr. B. G. Porter; Club Chairman, K. Cook; Secretary, T. McLean; Treasurer, K. Grant.

Upper Waitaki (Secretary: J. H. McCaw, "Cliffside," Hakataramea).

South Canterbury.

(District Secretary: C. C. Leitch, Department of Agriculture, Timaru.)

Albury (Secretary: M. Stevens, Albury).

Arno (Secretary: R. P. Lindsay, Waikakahi, R.M.D., Waimate).

Cannington-Cave (Secretary: R. McKenzie, Cave, Timaru).

Fairlie (Secretary: B. J. O'Neill, Allandale, Fairlie).

Geraldine (Secretary: R. L. Volckman, Te Moana).—Annual meeting. Officers elected: Advisory President, Mr. W. Crotty; Club Chairman, D. Chisnall; Secretary, R. L. Volckman; Treasurer, K. Hibbs.

Hunter (Secretary: J. D. Gregan, Hunter R.D., Waimate).—Annual meeting. Officers elected: Advisory President, Mr. A. W. Robinson; Club Chairman, J. W. T. Anstey; Secretary, J. P. Gregan; Treasurer, B. Mercer.

Maungati (Secretary: D. B. Neales, Maungati R.D.).—Annual meeting. Officers elected: Advisory members, Messrs. B. E. Evans, A. H. Cookson, and K. Winterbourne; Club Chairman, J. F. Collier; Secretary, D. B. Neales; Treasurer, W. Evans.

Milford (Secretary: G. D. Crossman, Milford, Temuka).—Annual meeting. Officers elected: Advisory members, Messrs. A. Johnson and A. D. Crossman; Club Chairman, J. Woodhead; Secretary, G. D. Crossman; Treasurer, W. McCormick.

Morven (Secretary: L. Paul, Waikakahi, R.D., Waimate).

Pleasant Point (Secretary: S. F. Jackson, Pleasant Point).—Annual meeting. Officers elected: Advisory members, Messrs. B. L. Elphick and V. Wilson; Club Chairman, A. D. Talbot; Secretary, S. F. Jackson; Treasurer, W. Skinner.

Southburn-Lyalldale (Secretary: R. Gray, St. Andrews, Timaru).

Waihaorunga (Secretary: H. A. Brown, care of Mr. T. Armstrong, Pentland Hills, R.D., Waimate).—Annual meeting. Officers elected: Advisory President, Mr. G. Barclay; Advisory members, Messrs. W. Armstrong and G. Cleland; Club Chairman, A. Young; Vice-Chairman, B. Armstrong; Secretary, H. A. Brown; Treasurer, A. Sheddon.

Mid-Canterbury.

(District Secretary, R. Inch, Department of Agriculture, Ashburton.)

Ashburton (Secretary: J. J. Burrowes, Chertsey).—Annual meeting. Officers elected: Advisory President, Mr. Aitken; Club Chairman, A. Bennett; Secretary, J. J. Burrowes; Treasurer, P. Harris.

Hinds (Secretary: D. G. Tait, Ashburton-Lowcliffe R.D.).

Mayfield (Secretary, W. Logan Doyle).—Lecture by Mr. W. J. Moore on "Sheep-farming in General."

Methven (Secretary, T. A. Richards, Box 74, Methven).

Christchurch.

(District Secretary: R. G. Jolly, Department of Agriculture, Christchurch.)

Darfield (Secretary: B. E. Jarman, Box 5, Darfield).—Annual meeting. Officers elected: Advisory President, Mr. C. O. Redfern; Club Chairman, J. W. Stewart; Secretary, B. E. Jarman; Assistant Secretary, C. H. Buttle.

Dunsandel (Secretary: A. T. Wright, Dunsandel, R.M.).—Discussion *re* 3YA broadcast. Arrangements for annual ball. A member read a lecture written by Mr. D. Wraight on "Pioneer Days of Dunsandel."

Ellesmere (Secretary: D. Harford, Doyleston, R.M.D., Christchurch).

Hororata (Secretary: J. Williams, Hororata).—Annual meeting. Officers elected: Advisory President, Mr. J. W. D. Hall; Club Chairman, T. R. Richards; Secretary and Treasurer, J. Williams.

Ladbrooks (Secretary: L. Carpenter, Prebbleton).—Annual meeting. Officers elected: Advisory President, Mr. F. Carpenter; Club Chairman, M. Meyer; Secretary, L. Carpenter; Treasurer, F. Nolan.

Little River (Secretary: R. J. Chapman, Little River).

Springston (Secretary: C. Bailey, Springston R. D.).—Annual meeting. Officers elected: Advisory President, Mr. P. V. Bailey; Club Chairman, R. Harris; Secretary, C. Bailey.

Teddington (Secretary: Alan H. C. Nutt, Motukarara, Christchurch).

West Melton (Secretary: G. G. Calder, Halkett).—Annual meeting. Officers elected: Advisory President, Mr. H. E. Cross; Club Chairman, R. N. Hille; Secretary, G. G. Calder; Treasurer, P. Ashwell.

North Canterbury.

(District Secretary: A. S. Nash, Department of Agriculture, Rangiora.)

Amberley (Secretary: G. Wornall, Amberley).—Annual meeting. Officers elected: Advisory President, Mr. A. Hislop; Club Chairman, C. Lewis; Secretary, G. Wornall; Treasurer, L. Croft; Reporter, P. Ford.

Amuri (Secretary: T. Harold Belton, Waiau).—Annual meeting. Officers elected: Advisory President, Mr. R. Bethell: Club Chairman, I. K. Dunbar; Secretary, T. Harold Belton; Treasurer, T. Harland.

Cust (Secretary: A. McIntosh, West Eyreton, Rangiora R.M.D.).—Annual meeting. Officers elected: Advisory President, Mr. A. F. Sheat; Club Chairman, C. Patient; Secretary, A. McIntosh; Treasurer, L. Blackmore.

Hawarden (Secretary: A. B. Dalzell, Hawarden).

Oxford (Secretary: W. Ian Croy, Oxford).—Annual meeting. Officers elected: Advisory President, Mr. C. Bassett; Club Chairman, C. Gamble; Secretary, W. I. Croy; Treasurer, N. Skurr.

Scargill-Omihi (Secretary: T. G. Maxwell, Motunau).—Annual meeting. Officers elected: Advisory President, Mr. A. Stone; Club Chairman, C. N. McKenzie; Secretary, T. G. Maxwell; Treasurer, A. Harrison.

West Coast.

(District Secretary: A. D. Mercer, Department of Agriculture, Greymouth.)

Murchison (Secretary: J. Boland, Longford).—Inaugural meeting. Officers elected: Advisory President, Mr. C. Lynch; Club Chairman, R. G. Thomson; Secretary, J. Boland; Treasurer, J. Thurlow. Mr. A. D. Mercer, Department of Agriculture, gave an outline of the Y.F.C. movement and also an address on "Slag."

Nelson.

(District Secretary: D. Merry, Department of Agriculture, Nelson.)

Dovedale (Secretary: P. J. Burnett, R.M.D., Wakefield).—Annual meeting. Officers elected: Advisory members, Messrs. F. M. Burnett and N. A. Win; Club Chairman, C. W. Silcock; Secretary, P. J. Burnett; Treasurer, I. S. Win.

Motueka (Secretary: Alan E. Wratt, "The Grange," Motueka).

Motupiko (Secretary: R. F. Mead, Motupiko).

Moutere (Secretary: S. Smith, care of H. R. Holdaway, Lower Moutere).

Marlborough.

(District Secretary: D. R. Wilkie, Department of Agriculture, Blenheim.)

Blenheim (Secretary: T. M. Walsh, Blenheim).—Annual meeting. Officers elected: Advisory President, Mr. J. B. Laidlaw; Club Chairman, Roy Litchfield; Vice-Chairman, J. Cresswell; Secretary and Treasurer, T. M. Walsh.

Flaxbourne (Secretary: R. Sharpe, Ward).—Mr. R. McGillivray, Fields Superintendent, Department of Agriculture, Christchurch, gave a talk on "The Y.F.C. Movement," and also a lecture on "Pastures," dealing with strains of pasture plants, pasture-management, the importance of liming and manuring and seed certification.

Seddon (Secretary: R. S. Dysart, Seddon).—Annual meeting. Officers elected: Advisory President, Mr. L. G. Dollar; Club Chairman, F. Conway; Vice-Chairman, W. Andrews; Secretary, R. S. Dysart; Treasurer, M. Hammond.

Wairarapa.

(District Secretary: N. Lamont, Department of Agriculture, Masterton.)

Alfredton (Secretary: N. C. Napier, R.M.D., Eketahuna).

Ballance (Secretary: H. C. Wilton, Ballance R.D.).—Sound film, "Reproduction of Mammals," exhibited by Mr. N. Lamont, Department of Agriculture.

Carterton (Secretary: M. Knutson, Dalefield).—Sound film, "Reproduction of Mammals," exhibited by Mr. N. Lamont, Department of Agriculture. Officers elected at the annual meeting: Advisory members, Messrs. G. E. Allen and A. Ross; Club Chairman, A. Fisher; Secretary, M. Knutson; Treasurer, L. Renall.

Eketahuna (Secretary: E. M. Wright, Nireaha).—Annual meeting. Officers elected: Advisory President, C. Mills; Club Chairman, F. B. Rossiter; Secretary and Treasurer, E. M. Wright.

Featherston (Secretary: J. W. Feast, Featherston).

Greytown (Secretary: V. Gates, Greytown).

Mangatainoka (Secretary: H. McG. Rentoul, Mangatainoka).

Martinborough (Secretary: H. K. Ronalds, Martinborough).—Sound film, "Reproduction of Mammals," exhibited by Mr. N. Lamont, Department of Agriculture.

Masterton (Secretary: C. A. Mackay, "Hillsborough," Wangaehu, Masterton).—Sound film, "Reproduction of Mammals," exhibited by Mr. N. Lamont, Department of Agriculture.

Pongaroa (Secretary: T. E. Hall, Pongaroa).

Tainui (Secretary. R. Spooner, Whareama, Masterton).

Manawatu.

(District Secretary: H. de O. Chamberlain, Department of Agriculture, Palmerston North.)

Apiti (Secretary: H. McIntyre, Ridge Road, R.D., Apiti).—Annual meeting. Officers elected: Advisory President, Mr. C. A. A. Spence; Club Chairman, F. V. Viles; Secretary and Treasurer, H. McIntyre.

Bunnythorpe (Secretary: MacGregor Donald, Newbury Line, R.D., Palmerston North).

Colyton (Secretary: C. Burr, Spur Road, R.D., Feilding).—Annual meeting. Officers elected: Advisory President, Mr. W. Hocken; Club Chairman, R. J. Shortall; Secretary and Treasurer, C. Burr.

Feilding (Secretary: R. W. Durrant, Box 34, Feilding).

Fitzherbert (Secretary: J. P. Woodley, Aokautere).

Halcombe (Secretary: G. Buchanan, Mount Biggs, R.D., Feildng).—Annual meeting. Officers elected: Advisory President, Mr. W. Powell; Club Chairman, E. W. Barnett; Secretary and Treasurer, G. Buchanan).

Johnsonville (Secretary, G. Bryant, Ohariu Valley, Johnsonville).

Kairanga (Secretary: I. Fraser, Box 9, Longburn).—Annual meeting. Officers elected: Advisory President, Mr. N. P. Nielsen; Club Chairman, D. Rowland; Secretary and Treasurer, I. Fraser.

Kimbolton-Kiwitea (Secretary: C. F. Tappin, Kimbolton R.D.).—Annual meeting. Officers elected: Advisory President, Mr. A. Lawson; Club Chairman, H. Beard; Secretary and Treasurer, C. Tappin.

Levin (Secretary: F. J. Rolston, Ihakara, Levin).—Arrangements finalized for club visit to Wellington. Address by Mr. J. Holden on forthcoming Y.F.C. activities. Annual meeting. Officers elected: Advisory President, Mr. H. J. Lancaster; Club Chairman, V. C. Lewis; Secretary and Treasurer, F. J. Rolston.

Oroua Downs (Secretary: J. E. Dench, Oroua, Downs).—Presentation by the Advisory President, on behalf of the Shannon Sports Club, of the trophies won by the club team in the horse-judging competition. Lecture by Mr. H. de O. Chamberlain, Department of Agriculture, on "Top-dressing."

Otaki - Te Horo (Secretary: R. W. Hillas, Box 35, Otaki Railway).

Paraparaumu (Secretary: H. W. Holland, Box 35, Paraparaumu).

Pohangina Valley (Secretary: A. Macdonald, Ashhurst).—Annual meeting. Officers elected: Advisory President, R. Macdonald; Club Chairman, H. M. Linklater; Secretary, A. Macdonald; Treasurer, J. Howell.

Rangiotu (Secretary: H. Lucas, Mangawhata R.D., Palmerston North).

Rangiwahia (Secretary: K. O'Dwyer, Rangiwahia).

Rongotea (Secretary: J. H. Gibbons, P.B., Rongotea).—Annual meeting. Officers elected: Advisory President, Mr. H. J. Lancaster; Club Chairman, F. Dear; Secretary and Treasurer, J. H. Gibbons.

Shannon (Secretary: C. Watson, care of Mr. G. G. Mitchell, Shannon).

Tokomaru (Secretary: K. R. Whyte, Tokomaru).—Inaugural meeting. Officers elected: Advisory President, Mr. L. Wilton; Club Chairman, Allan J. Moody; Secretary and Treasurer, K. R. Whyte.

Waituna (Secretary: I. H. Old, Cunninghame R.D., Feilding).—Annual meeting. Officers elected: Advisory President, Mr. N. V. Shannon; Club Chairman, R. Meads; Secretary and Treasurer, I. H. Old.

Whakarongo (Secretary: R. G. Scott, jun., Whakarongo R.D.).—Arrangements for club ball. Exhibition of New Zealand films by Mr. B. Wycherley.

Woodville (Secretary: A. Compton, Hopelands).—Annual meeting. Officers elected: Advisory President, Mr. D. Murray; Club Chairman, H. G. Goldsworthy; Secretary, A. Compton; Treasurer, A. Fountaine.

Wanganui.

(District Secretary: A. R. Dingwell, Department of Agriculture, Wanganui.)

Bulls (Secretary: S. H. Last-Harris, Parewanui Road, Bulls).

Hunterville (Secretary: P. S. Weston, Vinegar Hill, Hunterville).

Mangaweka (Secretary: J. Reilly, Kawhatau, Mangaweka).

Marton (Secretary: H. C. Kimpton, Box 40, Marton).—Annual meeting. Officers elected: Advisory President, Mr. H. G. Stewart; Club Chairman, A. B. Marshall; Secretary, H. C. Kimpton; Treasurer, W. Emmett.

Mangaweka (Secretary: R. O. Battey, Maowhango, Taihape).—Annual meeting. Officers elected: Advisory President, Mr. J. Bartosh; Club Chairman, A. R. Battey; Secretary and Treasurer, R. O. Battey.

Waimarino (Secretary: A. G. Mountfort, Raetihi Road, Ohakune).

Westmere (Secretary: C. Goldstone, Brunswick).—Annual meeting. Officers elected: Advisory President, Mr. B. Dawes; Club Chairman, K. Burtt; Secretary, C. Goldstone; Treasurer, J. Taylor.

South Taranaki.

(District Secretary: J. E. Davies, Department of Agriculture, Hawera.)

Alton (Secretary: G. Garnett, Alton).—Annual meeting. Officers elected: Advisory President, Mr. A. Taylor; Club Chairman, S. Leigh; Secretary, G. Garnett; Treasurer, C. Palmer.

Eltham (Secretary: L. R. Sulzberger, Eltham).—Annual meeting. Officers elected: Advisory President, Mr. H. Lambie, Mangatoki; Club Chairman, M. Tarrant, Eltham; Secretary, L. R. Sulzberger; Treasurer, L. Carlson.

Hawera (Secretary: C. G. Washer, South Road, Inaha, Hawera).—Annual meeting. Officers elected: Advisory President, Mr. P. O. Veale; Club Chairman J. W. Johnson; Secretary, C. G. Washer; Treasurer, S. Johnston.

Kaponga (Secretary: J. J. Kissick, Kaponga).

Lowgarth (Secretary: J. T. Sulzberger, Lowgarth).

Pukengahu (Secretary: G. L. Burgham, Wingrove Road, Pukengahu, Stratford).—Annual meeting. Officers elected: Advisory President, Mr. T. Rae; Club Chairman, R. Bremer; Secretary, G. L. Burgham; Treasurer, R. J. Haseltine.

Waverley (Secretary: W. P. Matthews, Box 26, Waverley).

Whakamara - Mokoia (Secretary: J. Buckrell, Whakamara).—Annual meeting. Officers elected: Advisory President: Mr. A. J. Davies; Club Chairman, S. Wrigley; Secretary, J. Buckrell; Treasurer, G. Dobson.

Whenuakura (Secretary: J. Fairweather, Private Box, Patea).

North Taranaki.

(District Secretary : G. A. Blake, Department of Agriculture, New Plymouth.)

Cardiff (Secretary : W. Brunton, Cardiff).—Annual meeting. Officers elected : Advisory President, Mr. A. O'Sullivan ; Club Chairman, A. Johnson ; Secretary, W. Brunton ; Treasurer, R. Morrison.

Hillsborough-Tarurutangi (Secretary : N. T. Sampson, Hillsborough, New Plymouth).

Inglewood (Secretary : H. J. Clough, Inglewood).—Talk by Mr. S. Fabish on his tour through America. Talks on the recent District Y.F.C. North Island tour were given by members who participated, H. Clough, D. Marr, and F. J. N. Bracegirdle.

Kawakawa (Secretary : L. V. Oliver, Lepperton).—Annual meeting. Officers elected : Advisory President, Mr. C. B. Lepper ; Club Chairman, K. G. Lattimer ; Secretary and Treasurer, L. V. Oliver.

Mangamahoe (Secretary : L. Mace, Kent Road, R.D., New Plymouth).—Lecture by Mr. G. A. Blake on "Selecting a Sow from a Litter, and the Care with Farrowing."

Mangorei (Secretary : E. Owen Balsom, Upper Mangorei, New Plymouth).—Lecture by Mr. G. A. Blake on "The Care and Management of the Sow."

Okau-Tongaporutu (Secretary : K. Calvert, Ahititi, New Plymouth).—Annual meeting. Officers elected : Advisory President, Mr. J. Jimmieson ; Club Chairman, E. W. J. Foreman ; Secretary, K. Calvert ; Treasurer, M. Collins.

Tikorangi (Secretary : G. Jupp, P.O. Box 27, Tikorangi, New Plymouth).—Arrangements for a field-day. Club debate, the subject being "Motor Power *v.* Horses," the speakers being V. Foreman, V. Sartin, J. Ritchie, L. Soffe, and J. Orchard (motor power), and S. Soffe, G. Foreman, G. Jupp, F. Jupp, and J. Alexander (horses). The judge, Mr. C. P. Mahy, gave his decision in favour of the "motor power" supporters by a small margin.

Toko (Secretary : W. H. Needham, Toko).—Annual meeting. Officers elected : Advisory President, Mr. G. W. Were ; Club Chairman, L. J. Kilsby ; Secretary, W. H. Needham ; Treasurer, C. C. Rowe.

Urenui (Secretary : K. Phillips, Waitoitoi).—Annual meeting. Officers elected : Advisory President, Mr. J. F. Phillips, Club Chairman, A. Wetton ; Secretary, K. Phillips ; Treasurer, G. Sulzberger.

Southern Hawke's Bay.

(District Secretary : J. W. Palmer, Department of Agriculture, Hastings.)

Dannevirke (Secretary : K. Bateman, Box 38, Dannevirke).

Hastings (Secretary : H. M. Campbell, Box 128, Hastings).—Annual meeting. Officers elected : Advisory President, Mr. S A. Bainbridge ; Club Chairman, J. R. Trotter ; Secretary, H. M. Campbell ; Treasurer, D. Agnew.

Norsewood (Secretary : B. D. Anderson, R.D., Norsewood).—Annual meeting. Officers elected : Advisory President, Mr. R. Anderson ; Club Chairman, J. C. Kilgour ; Secretary, B. D. Anderson ; Treasurer, R. Somerville.

Onga Onga (Secretary : Clive H. Masters, Onga Onga).—Annual meeting. Officers elected : Advisory President, Mr. E. S. Bibby ; Club Chairman, L. E. Bradley ; Vice-Chairman, T. Schaw ; Secretary, Clive H. Masters ; Treasurer, R. Jensen.

Takapau (Secretary : M. N. Tilley, Takapau).—Annual meeting. Officers elected : Advisory President, Mr. N. Tilley ; Club Chairman, L. Thomsen ; Secretary, M. N. Tilley ; Treasurer, G. White.

Tikokino (Secretary : H. Eddy, Tikokino).

Waipukurau (Secretary : J. I. Mackie, Box 54, Waipukurau).—Lecture by Mr. J. W. Palmer, Department of Agriculture, on "Top-dressing." The speaker dealt with various aspects, including the experiments carried out by the Department of Agriculture.

Northern Hawke's Bay.

(District Secretary : R. P. Hill, Department of Agriculture, Hastings.)

Matapiro (Secretary : H. Pearce, care of Box 32, Hastings).

Meeanee (Secretary : J. H. McGrath, Meeanee, Napier).—Annual meeting. Officers elected : Advisory President, Mr. S. Parsons ; Club Chairman, E. L. Fairey ; Secretary, J. H. McGrath ; Treasurer, W. J. Griffiths.

Nuhaka (Secretary : N. J. Alexander, Nuhaka).

Putorino (Secretary : E. Smyth, P.O., Raupunga).—Annual meeting. Officers elected : Club Chairman, D. Hayes ; Secretary, E. Smyth ; Treasurer, E. Boustead. The appointment of an Advisory President was left over until the next meeting.

Wairoa (Secretary : W. G. Brownlie, Frasertown, Wairoa).

Poverty Bay.

(District Secretary : E. M. Bates, Department of Agriculture, Gisborne.)

Gisborne (Secretary : G. W. Smith, Box 246, Gisborne).

Te Karaka (Secretary : A. D. N. Manuel, Te Karaka, Gisborne).

Tolaga Bay (Secretary : D. G. Craill, Box 48, Tolaga Bay).—Annual meeting. Officers elected : Advisory President, Mr. E. Robison ; Club Chairman, M. Robison ; Secretary and Treasurer, D. G. Craill.

Taumarunui.

(District Secretary : J. M. Hopkins, Department of Agriculture, Taumarunui.)

Taumarunui (Secretary : L. G. Smith, Patunga, Taumarunui).

Te Kuiti.

(District Secretary : K. M. Montgomery, Department of Agriculture, Te Kuiti).

Aria (Secretary : E. A. Riddle, Aria).

Otorohanga (Secretary : C. G. Murphy, Te Kuiti Road, Otorohanga).—Business meeting. Discussion *re* forming of a pig club. Arrangements for a cricket match.

Te Anga (Secretary : H. O. Goddard, Te Anga, R.D., Te Kuiti).

Eastern Bay of Plenty.

(District Secretary : C. R. Taylor, Department of Agriculture, Whakatane.)

Edgecumbe (Secretary : A. R. N. Briggs, R.D., Whakatane).—Annual meeting. Officers elected : Advisory President, Mr. D. McCracken ; Club Chairman, G. R. Munay ; Secretary, A. R. N. Briggs ; Treasurer, J. S. Murray.

Opotiki (Secretary : I. D. Grant, Woodlands, Opotiki).—Lecture by Mr. Steele on "How to Conduct a Meeting." This was followed by a club debate.

Taneatua (Secretary : W. Garlick, Taneatua).—Annual meeting. Officers elected : Advisory President, Mr. M. Grace ; Club Chairman, F. Mead ; Secretary, W. Garlick ; Treasurer, W. Grace.

Waimana (Secretary : D. Woolfield, Waimana).

Western Bay of Plenty.

(District Secretary : A. V. Allo, Department of Agriculture, Tauranga.)

Katikati (Secretary : T. J. Pamment, Katikati).—Discussion on radio sessions for Y.F.C. members. Club debate, the subject being "That We are too Fond of Sport." The speakers were H. Capamagian, W. Capamagian, D. Clague, and E. F. Marshall (affirmative), and M. Palmer, R. Walford, C. Grainger, G. B. Walford, and D. B. Thomas (negative).

Omokoroa (Secretary : H. Emery, Omokoroa).—Annual meeting. Officers elected : Advisory President, Mr. R. W. Strugnell ; Club Chairman, F. Dalgetty ; Secretary and Treasurer, H. Emeny ; Assistant Secretary, C. Forman.

Paengaroa (Secretary : Cliff W. Riddell, Ota, R.D., Te Puke).—Annual meeting. Officers elected : Advisory President, Mr. J. B. Cawte ; Club Chairman, A. F. Walter ; Secretary, Cliff W. Riddell ; Treasurer, A. W. Riddell.

Tauranga (Secretary : A. J. Voss, Tauranga R.D.).—Annual meeting. Officers elected : Advisory President, Mr. G. Norris ; Club Chairman, K. J'Anson ; Secretary, A. J. Voss ; Treasurer, L. Ferguson.

Te Puke (Secretary : J. Phare, Te Puke).—Annual meeting. Officers elected : Advisory President, Mr. D. S. Ross ; Club Chairman, J. McNaughton ; Secretary, J. Phare ; Treasurer, J. Nichol.

Waihi (Secretary : A. Blackmore, Old Tauranga Road, Waihi).—Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "Cropping in Canterbury."

Rotorua.

(District Secretary : C. S. Dalgliesh, Department of Agriculture, Rotorua.)

Horo Horo (Secretary : T. D. Kingi, Box 174, Rotorua).

Ngakuru (Secretary : J. E. Willoughby, Ngakuru, R.D., Rotorua).

Putaruru (Secretary : B. Farrelly, Putaruru).—Film exhibited by Mr. C. Walker, Department of Agriculture, showing "Methods of Clearing Land."

Rotorua-Ngongotaha (Secretary : E. L. Lewis, 58 Malfroy Road, Rotorua).—Lecture by Mr. Reensburg on "Pigs and their Winter Management." Some of the club members attended the Jersey breeders' field-day at Hamilton, where Mr. C. E. Robertson, manager of the stud stock department of Messrs. Wright, Stephenson, and Co., gave an instructive demonstration.

Waikato.

(District Secretary : J. F. Shepherd, Department of Agriculture, Hamilton.)

Huntly West (Secretary : J. W. Furniss, Ruawaro, Huntly R.D.).—Arrangements for a dance ; visit to Frankton Box-factory finalized. Debate "The Merits of the Electric Fence" ; J. W. Furniss in favour) and T. Sefton (against).

Kakepuku (Secretary : E. F. Hopping, Te Kawa).—Annual meeting. Officers elected : Advisory President, Mr. W. G. Neill ; Club Chairman, G. P. Ray ; Secretary, E. F. Hopping ; Treasurer, B. Boswill.

Matamata (Secretary : S. K. Duxfield, Station Road, Matamata).

Matangi (Secretary : J. R. Ranstead, Matangi).

Tahuna (Secretary : E. R. Elliott, Hoe-o-tainui R.D., Ohinewai).—Lecture by Mr. Stewart, of Morrinsville, on "Common Diseases of the District and Their Treatment."

Te Aroha (Secretary : J. P. Hunt, Box 58, Te Aroha).

Te Kowhai (Secretary : C. H. Weedon, Te Kowhai).—Annual meeting. Officers elected : Advisory members, Messrs. F. C. Roberts and A. L. Whitford ; Club Chairman, I. A. Porter ; Secretary and Treasurer, C. H. Weedon.

Auckland.

(District Secretary : J. E. Bell, Department of Agriculture, Auckland.)

Franklin (Secretary : R. W. Franke, Runciman).

Mangatawhiri (Secretary : G. Quick, care of Mr. C. Peach, Maramarua).—Annual meeting Officers elected : Advisory President, Mr. A. E. Webb ; Club Chairman, T. Maxwell ; Secretary, G. Quick ; Treasurer, F. Steed.

Warkworth.

(District Secretary : P. S. Syme, Department of Agriculture, Warkworth.)

Port Albert (Secretary : T. Shepherd, Port Albert R.D., Wellsford).—Inaugural meeting. Officers elected : Advisory President, Mr. F. Reid ; Club Chairman, L. Phyn ; Secretary, T. Shepherd ; Treasurer, E. Shaw.

Wellsford (Secretary : J. Beecher, Wellsford).—Inaugural meeting. Officers elected : Advisory President, Mr. W. Smith ; Club Chairman, W. Hedges ; Secretary, J. Beecher ; Treasurer, W. Logue.

Whangarei.

(District Secretary : E. B. Glanville, Department of Agriculture, Whangarei.)

Matarau (Secretary : W. A. Rushbrook, Matarau Road, R.D., Whangarei).—Annual meeting. Officers elected : Advisory President Mr. H. H. Wilsher ; Club Chairman, H. G. Agnew ; Secretary, W. A. Rushbrook ; Treasurer, I. D. Bodle.

Maungakaramea (Secretary : G. R. Porter, Maungakaramea).—Annual meeting. Officers elected : Advisory President, Mr. R. N. Attwood ; Club Chairman C. W. Timperley ; Secretary and Treasurer, G. R. Porter.

Dargaville.

(District Secretary : E. H. Arnold, Department of Agriculture, Dargaville).

Arapohue (Secretary : J. T. Studholme, Arapohue, Dargaville).—Annual meeting. Officers elected : Advisory President, Mr. H. Montgomery ; Club Chairman, N. Vallance ; Secretary, J. T. Studholme ; Treasurer, B. L. Cleary.

Maroheno (Secretary : L. Maras, R.D., Maungaturoto Railway).—Annual meeting. Officers elected : Advisory President, Mr. J. Bradley ; Club Chairman, J. Petrie ; Secretary, L. Maras ; Treasurer, J. Brooks.

Ruawai (Secretary : E. Barnes Walker, Parahi, Matakohe).—Annual meeting. Officers elected : Advisory President, Mr. L. E. Ambury ; Club Chairman, S. Walton ; Secretary, E. Barnes Walker ; Treasurer, P. Thomas.

Tangiteroria (Secretary : J. H. Boyes, Kirikopuni).—Inaugura lmeeting. Officers elected : Advisory President, Mr. R. J. Bale ; Club Chairman, J. Bale ; Secretary, J. H. Boyes ; Treasurer, A. Cates.

Kaitaia.

(District Secretary : Mr. A M. Lee, Department o Agriculture, Whangarei.)

Broadwood (Secretary : Mr. D. Hawkins, R.D., Kohukohu).—Annual meeting. Officers elected : Advisory President, Mr. Jas. McKenzie ; Club Chairman, J. McKenzie, jun. ; Secretary, D. Hawkins ; Treasurer, J. Hick.

Herekino (Secretary : Dave Keay, Herekino).

Kaeo (Secretary : W. D. McGee, Box 44, Kaeo).

Kaitaia (Secretary : T. W. Flinn, care of Mr. R. D. Hanlon, Kaitaia).

Oruru (Secretary : H. Frew, R.D., Kaitaia).—Annual meeting. Officers elected : Club Chairman, O. F. Packard ; Secretary, H. Frew ; Treasurer, C. Forsyth.

Umawera (Secretary : B. Gray, R.M.D., Okaihau).—Lantern lecture by Mr. E. B. Glanville, Department of Agriculture, on "Gum-lands and their Development."

Health Notes for the Farm.

Contributed by the Department of Health.

The Middle Years of Life.

SHAKESPEARE, in his delightful comedy "As You Like It," puts into the mouth of one of the characters, the melancholy Jaques, the wonderful lines, "All the world's a stage . . . ," in which he depicts the world as the stage of a theatre and men and women as the actors. He divides the actors' lives into seven ages and he assigns characters to each age, and all of these we can recognize to-day as true to life, although described 300 years ago.

Just as realistically as Shakespeare divided the life of man into seven age groups or periods, so may the general health of mankind be dealt with. We can usefully classify these health ages into—

(1) The Infant.
(2) Young Childhood.
(3) School-children.
(4) Adolescence.
(5) Manhood.
(6) Middle Age.
(7) Old Age.

It is the health of middle age that this article deals with, for it is often during this stage of life that a great variety of functional and organic breakdowns occur. What years of life are included in this middle age? The "average duration and expectation of life" are considerably lengthened to-day in comparison with Shakespeare's time, probably by fifteen to twenty years, and what was then regarded as old age would probably now be termed middle age.

We may, however, regard middle age as comprising the years forty to sixty. It is true some men and women are comparatively young at sixty and others old at fifty.

Whose Responsibility.

Preventive medicine has in this present century been largely concerned with the protection of the health of the rising generation, and rightly so, but the preservation of the health of the middle-aged individual is also important. The health of the rising generation is primarily the responsibility of parents and the instructors of youth. This responsibility can, and is, assisted by the State and voluntary organizations, so that every child born into the world shall have a good start in the struggle of life.

When the child comes to manhood and to middle age the responsibility is largely on the individual. That the individual should recognize and accept this responsibility is most important and is in the interests and welfare of the community.

How can the individual keep fit and avoid sickness and disease, and by so doing safeguard these important interests? To keep fit the individual must exercise due care for the functions and systems of the body. In middle age there are two systems which require careful attention—one is the digestive system, and the other the nervous system.

Digestive System.

The digestive system in middle age requires attention in the selection of a suitable diet and necessary recreation. "Moderation in all things" is the keystone on which the health of middle life is maintained. There is a common expression that some men "dig their graves with their teeth."

The daily intake of food should be restricted to the amount necessary for the nutrition of the body which, in middle age, requires less than in earlier age because of restricted activity. This does not mean that the food, meat, and drink must be accurately weighed or estimated in calories of heat-production. It is not the "valetudinarian habit" that is required, but common sense. In general, that amount is right which will maintain the most favourable condition of weight.

A healthy individual should be able to decide for himself which is the right amount and kind of food to eat. However, it might be said that, in addition to being clean and unadulterated, the diet should be of the right composition and contain neither too much protein (meat, fish, cheese, &c.) nor too much fat (butter, cream, &c.) nor too large an amount of carbohydrate (starch foods, such as potatoes, rice, &c.). The body needs the right kinds of food mixed in suitable proportions.

Constipation.

The middle-aged adult is liable to eat too much, not recognizing perhaps soon enough the lessened bodily activity due to increasing years, and in consequence the intestinal tract and the liver and kidneys are called upon to do more work than necessary and the body is loaded with the products of incomplete digestion in excess of normal. If the movements are too slow constipation results, and waste material accumulates and poisons the body and is liable to cause indigestion, headaches, and sensations of fatigue and dullness often associated with middle life.

Constipation should be avoided by a plain wholesome and suitable diet, including a sufficiency of green vegetables, fruit, and fluids, and exercise active enough to overcome the tendency to sluggishness of the elimination organs.

The amount of active recreation necessary to avoid fatigue is, as with diet, a matter of common sense. It depends to a great extent on the nature of a person's work. Walking is the most natural form of exercise; it is inexpensive and has an unlimited range of graduations. It is

probably one of the best of all active recreations for middle age, and might be supplemented by such games as bowls, croquet, golf, and tennis in moderation. A hobby does not have to be costly or consume a great deal of time. It is remarkable, for instance, what results can be secured from a few minutes' work each day in a small garden.

Sleep.

Sleep is allied to recreation in the preservation of good health. There is no fixed amount for each individual. However, late hours should be avoided and ample time allowed for refreshing sleep. After the age of forty-five one cannot read print easily, and it is important to have the vision corrected by proper glasses by a qualified eye specialist. Eyestrain from badly fitting glasses may in time seriously affect the eyesight or health. The teeth also need careful attention. The dentist should be regularly consulted. Defective teeth are the cause of much ill-health.

The nervous system is closely allied to the digestive system, so much so that the one system cannot be impaired for any length of time without upsetting the other. The well-being of the nervous system depends, among other things, on the avoidance of (1) unnatural excitement and (2) worry. It is the duty of the individual to combat these two evil habits, which, no doubt, are the cause of much mental and physical disease.

Hobbies.

Literature, art, and the practice of some congenial hobby beneficially diverts the mind from the pressing perplexities of life and assists the human body to adapt itself to the natural changes taking place, for the human body never remains stationary. It is being broken down and built up continually. During the middle of life there are times when it may be wise to consult a doctor and to co-operate with him in whatever can be done to restore health, to prevent illness, and to maintain in all its fullness a normal and effective personality.

In one of her letters Lady Mary Wortley Montague remarks that she is so happy that she regrets she cannot live three hundred years. We all have moments like that when life seems so good that we envy the patriarchs and would be glad if we could abide here longer than Nature permits. But such moments of joy in life are only to be earned by a careful and wholesome respect for the bodies we are given to use and enjoy.

International Congress of Viticulture.

THE International Congress of Viticulture will take place at Bad Kreuznach from 21st to 26th August, 1939, under the patronage of Walther Darré, Reich Minister for Food and Agriculture. The Managing President is Brigadeführer Ed. Diehl, Reichsfachwart of Viticulture, and the Secretary-General is Director Guenther.

Representatives of all nations interested in viticulture will take part in this Congress.

For further information please apply to the office of the Secretary-General, Berlin, W. 35, Potsdamerstr. 101.

Farmers!

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New Price List for Wallaceville Poultry Station.

SITTINGS OF EGGS.

Season commences about 1st July and terminates about 30th November. Orders may be booked ahead, and advance booking is advisable to ensure procuring requirements. This particularly applies when delivery is desired during the months of August and September.

Class.	Breed.	Description of Eggs.	Prices. Per Dozen. s. d.
A–1 ..	White Leghorn..	From flock matings	6 6
A–3 ..	Langshan ..	From flock matings (*limited to three dozen for any one order*)	6 6
B–1 ..	White Leghorn	From trap-nested hens (200 eggs and over) mated with cockerels from hens which have produced 200 eggs and over. (*Limited to three dozen for any one order*)	12 0
B–2 ..	White Leghorn..	Of pure New South Wales Government strain. (*Limited to one dozen for any one order*)	12 0
B–3 ..	White Leghorn..	Crossed strain: From trap-nested hens (200 eggs and over) mated with imported English cockerels. (*Limited to one dozen for any one order*)	12 0
B–4 ..	Langshan ..	Crossed strain: From selected hens mated with imported English cock. (*Limited to one dozen for any one order*)	12 0
B–5 ..	Australorp(Utility Black Orpington)	From recently imported stock from New South Wales Government. (*Limited to three dozen for any one order*)	12 0

NOTE.—Postage or railage free; will be posted unless otherwise instructed.

Class C.—White Leghorn, in incubator lots (flock matings only), 8 dozen or more, 5s. per dozen, railage free. If to be sent by post, 6d. per dozen extra.

Special boxes are used for packing eggs. For small lots boxes holding *one dozen each* are used, and are transmitted through the post-offices as FRAGILE PARCELS, and should thus carry safely to any part of New Zealand.

For incubator lots of eggs larger boxes are used.

DAY-OLD CHICKS (UNSEXED.)

Obtainable from August to October—Prices free-on-rail Upper Hutt.

Class.	Breed.	Under 50.	50 to 99.	100 and over.
D–1 ..	White Leghorn	1s. each (25 for £1 5s.)	1½d. each (50 for £2 8s.)	1d. each (100 for £4 11s.)
D–3 ..	Langshan ..	1s. each (25 for £1 5s.)	Limited to twenty-five chicks for any one order.	
D–4 ..	Australorp (Utility Black Orpington) from imported stock	1s. each (25 for £1 5s.)	Limited to twenty-five chicks for any one order.	

The sexing of day-old chicks is not undertaken at Wallaceville.

BREEDING BIRDS.

(All Prices are free-on-rail Upper Hutt.)

Class.	Description of Birds.	Prices (according to Selection).
	Hens, terminating Second Laying-season.	
E–1 ..	White Leghorn	5/– and 7/6
E–3 ..	Langshan	5/– and 7/6
	Hens, terminating First Laying-season.	
F–1 ..	White Leghorn	10/–, 15/–, and 20/–
F–3 ..	Langshan	10/–, 15/–, and 20/–
	Pullets (not available until March).	
G–1 ..	White Leghorn	20/– and 30/–
G–3 ..	Langshan	20/– and 30/–
G–4 ..	Australorp (Utility Black Orpington), (from imported stock)	20/– and 30/–
	Pullets, Ten Weeks old (available after 1st November each Year).	
	ORDER EARLY.	
H–1	White Leghorn	6/–
H–3	Langshan	6/–
H–4	Australorp (Utility Black Orpington), (from imported stock)	6/–
	Laying Pullets (not available until March).	
	(A limited number only, for laying but not necessarily suitable for breeding purposes, will be available.)	
I–1 ..	White Leghorn	10/–
I–3 ..	Langshan	10/–
I–4 ..	Australorp (Utility Black Orpington), (from imported stock)	10/–
	Cockerels (not available until March).	
J–1 ..	White Leghorn	20/–, 30/–, and 40/–
J–2A	White Leghorn, of part English strain	20/–, 30/–, and 40/–
J–3A	White Leghorn, of pure English strain	20/–, 30/–, and 40/–
J–4 ..	Langshan	20/–, 30/–, and 40/–
J–5 ..	Australorp (Utility Black Orpington), (from imported stock)	20/–, 30/–, and 40/–

Full particulars may be obtained from the Poultry Overseer, Veterinary Laboratory, Private Bag to Wallaceville, Wellington.

run is being sweetened. Failing this, it is well to give all runs a good dressing with lime at about 1 lb. per square yard. A good time to do this liming is during May or June.

Tainted ground is undoubtedly responsible for many diseases from which poultry suffer, and precautions should be taken to keep their runs as clean and sweet as possible.

Exercise.

Where poultry have a good, free range the question of exercise does not call for much attention, but where they are kept in small yards or on the intensive system it is necessary to ensure that they are encouraged to take exercise in order to keep them in good condition and to maintain their resistance to disease.

Exercise is best encouraged by providing plenty of good, dry litter, and scattering all grain evenly among it. Care should be taken to see that the litter does not become too heavy or damp, for if this happens the birds will not take the necessary exercise.

Feeding.

With many poultry-keepers good practical feeding is really more an art than a science. Although they may not know how to calculate a balanced ration they do feed correctly, and this is done by keen observation and close attention to detail.

Briefly, it may be said that the three main points in feeding are quality, quantity, and regularity. Never feed any material that is not wholesome, such as musty grain, tainted meat, or decayed vegetables or fruit. Good-quality food is found to be the cheapest in the long-run.

While it is necessary to feed plenty of good, wholesome food, care should be taken to see that none is wasted and left lying about to go sour. Plenty of trough feeding space—about 3 in. per bird—should be allowed, and care should be taken to ensure that all feeding-equipment such as mixing-troughs, &c., are kept in a clean and sanitary condition.

Drinking-water.

The great importance of a good, clean, and constant supply of drinking-water is sometimes not fully realized. It is from the water-supply that infectious disease is often transmitted through a flock, and one of the surest ways of checking egg-production is by leaving the birds short of water. When birds are laying they require twice the quantity of water that is needed when they are not laying.

Water-dishes should be so placed that the water is not likely to be contaminated from litter or manure. All drinking dishes and fountains should be cleaned regularly each day.

(To be continued.)

—C. J. C. Cussen, Chief Poultry Instructor, Wellington.

Make Every Winter Month a BONUS MONTH in 1939

Every winter egg you get is worth nearly twice as much as every summer egg. No effort should be spared, therefore, to ensure that you get your birds away to a good ***start*** towards full capacity laying between April and September. Put them on Karswood now, the PROVED poultry tonic, that turns pullets and hens into veritable winter-egg-producing machines.

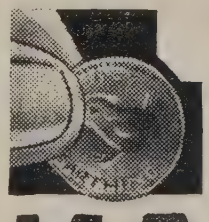
The reason why Karswood puts extra money in the pocket of every poultry-owner is explained in a few words. During the winter season *ground insects*, the hen's natural tonic stimulant, are notoriously scarce. Karswood remedies this shortage—it supplies these valuable insects, plus blood-enrichers, which help the tiny egg-seeds inside the hen to ripen at a steadier, faster rate. In other words, Karswood assists the bird to deliver the goods in Winter just as Nature enables her to do in the Spring.

Cash in on profits in a BIG WAY this winter. BANK on Karswood for a bumper egg-yield! Read this :—

1,300 EGGS PER WEEK FROM 250 PULLETS.

I know you like to hear from users as to what results they have had before and after using Karswood Poultry Spice. However, I am pleased to say there has been no "before" with me. I have been using your Karswood Poultry Spice ever since I started keeping poultry about twelve years ago. At present I run a flock of about 400 birds (ducks and fowls), and they all have your Karswood Spice and are in perfect health. My flock of 250 pullets has yielded a steady average of 1,300 eggs per week for some time past. I put it down to Karswood Poultry Spice, and keep using it. My losses from illness during the past six months are NIL, and, considering I live in a cold district, I think my results are excellent. My advice to any poultry-keeper is : "Karswood your cares away."—A.C.

(Original letter on file for inspection.)



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1/- packet of Karswood supplies 20 hens for 16 days; 2/- packet supplies 40 hens for 16 days; 7 lb. tin (12/6) supplies 280 hens for 16 days. Try a shilling packet.

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Increases egg-production without forcing, because it contains ground insects, but no cayenne pepper, &c.

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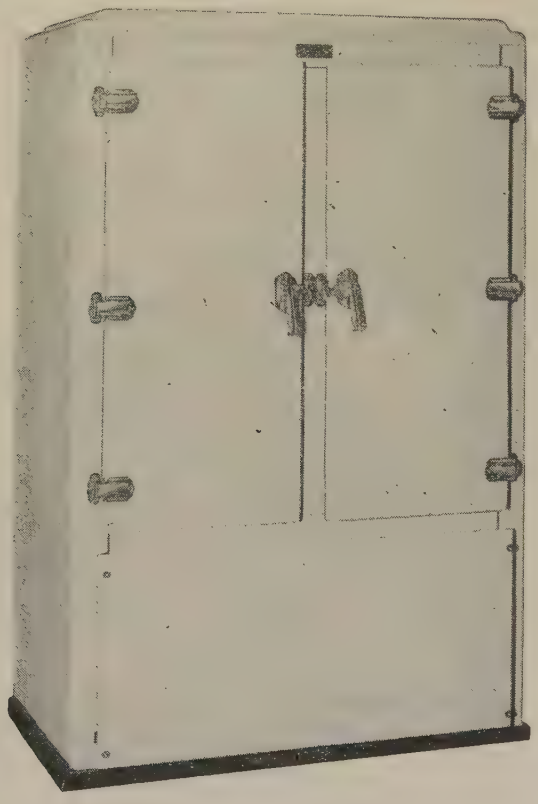

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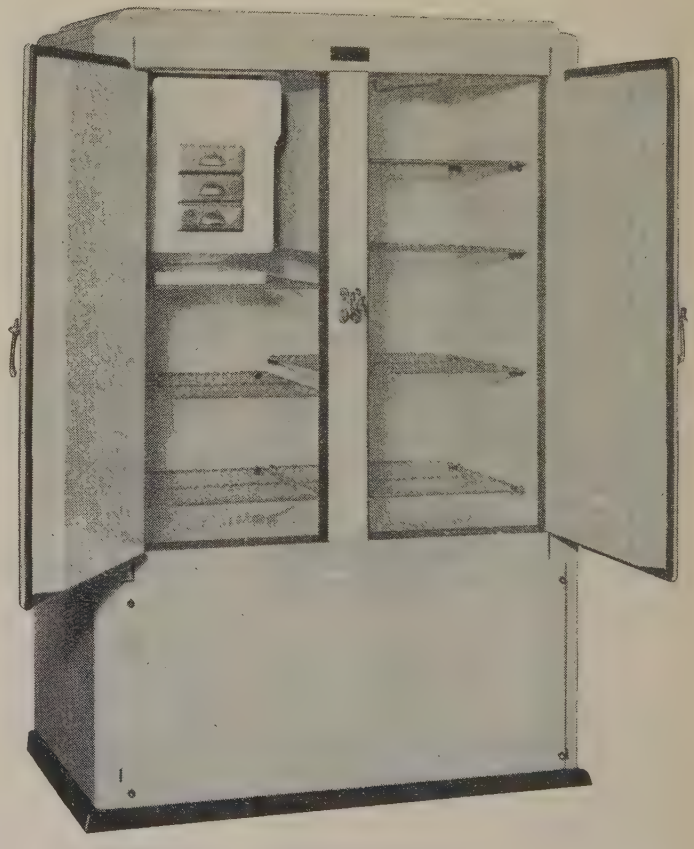

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FRIGIDAIRE NEW ZEALAND

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Workshop Ideal.

The " bench " of the mechanic can serve as a model for the kitchen. Here, above the working-surface or adjacent to it, are strips, pockets, and hooks for holding every tool and supply needed in his particular work. There are no doors to open and take up valuable floor-space, no waste motion pulling out drawers, and no confusing or blunting of one tool with another.

Thus it is seen that the kitchen must follow this workshop ideal. Every utensil and tool should have a definite place either on a hook of its own or on an open shelf so that it can instantly be grasped and used without waste handling.

Next in importance to correct grouping is the correct and comfortable height for all working surfaces and equipment. For years women have stooped their backs over sinks and tables that were too low, strained their muscles over ironing-boards that were too high, bent themselves double peering into the oven, or stretched for utensils away out of reach. No shelves should be lower than 1 ft. from the floor nor higher than 6 ft.; and for small women a comfortable reaching height is between $4\frac{1}{2}$ ft. and $5\frac{1}{2}$ ft.

The sink, as universally installed, is several inches too low for the woman to work without bending over, thus increasing the strain and fatigue of the already fatiguing task of dish-washing.

No absolute rule can be given for invariable heights, because not only the height of the worker must be taken into consideration, but also the length of her arm and whether she is short or long-waisted, &c.

Sit While Working.

Another great preventive of strain and fatigue is the practice of sitting down to many household tasks. It is only custom, or a false fear that they will be considered lazy, which makes many women object to sitting down at work. A high stool (preferably with an adjustable seat) can be used when washing dishes, peeling vegetables, preparing pastry, and many other tasks.

Adequate lighting and ventilation are two further essentials to kitchen efficiency. Cross ventilation is essential to keep the kitchen well aired and free from odours.

The labour-saving kitchen must meet the highest ideals of sanitation. Therefore, all its surfaces—floor, walls, tables, &c.—should be as non-absorbent, non-porous, and as easy to clean as possible.

Definition of Terms Used in Meat Cookery.

Bake, v.t.: To cook by indirect dry heat, usually in an oven, or in hot ashes, upon heated metal or stones, &c.; to roast, especially when said of meat (to roast beef).

Barbecue, v.t.: To roast slowly (an animal) whole or in pieces on a gridiron, spit, or over coals in a specially prepared trench. Meat is usually basted with a highly seasoned sauce.

Baste, v.t.: To moisten meat while cooking to prevent drying and to add flavour. The liquid used is usually pan drippings, water, or water and fat.

Boil, v.t.: To subject to the action of the heat of boiling liquid, especially water (see Simmer). NOTE.—Meat should be simmered, not boiled.

Bouillon, n. (F.): Liquid made by simmering beef or other meat, seasoned, freed from fat and flocculent material (clarified); a clear soup or broth.

Braise, v.t.: To brown (meat) in a hot receptacle in a small amount of fat, then to cook slowly in juices from the meat or in added liquid in a covered utensil. The added liquid may be water, milk, cream, meat stock, dilute vinegar, or juices from vegetables.

Broil, v.t.: To cook by radiant (direct) heat from hot coal, a gas flame, or electric element; grill.

Broth, n.: Liquid in which meat, fish, vegetables, or cereals, &c., have been cooked; it contains dissolved and flocculent material; may or may not contain fat; a thin soup. See Stock.

Consomme, n. (F.): A clear, strong broth of meat and vegetables; usually made from two or more kinds of meat, such as beef, veal, and chicken; seasoned, freed from fat and flocculent material (clarified).

Fricassee, n.: A dish made of fowl, veal, or other meat cut in pieces and stewed in gravy. Braising is the method used in making a fricassee. See Braise.

Fry, v.t.: To cook in fat; applied especially (1) to cook in a small amount of fat (also called sauté); (2) to cook in a deep layer of fat (also called deep fat frying).

Lard, v.t.: To place strips of fat, called lardoons, on top of or to insert into meat to add flavour and to prevent dryness.

Lardoon (lardon), n.: A long, slender, pencil-like portion of fat, such as pork fat, bacon, or suet, used in larding.

Marinade, n.: An acid liquor, usually with seasoning and with or without oil, in which meat is allowed to stand before cooking to improve flavour and to increase tenderness.

Marinate, v.t.: To treat with a marinade.

Panboil, v.t. To cook in a hot, uncovered frying-pan, pouring off fat as it accumulates in the pan.

Parboil, v.t.: To simmer for a short time preliminary to cooking by another method.

Pot Roast, n.: A piece of meat cooked by braising.

Roast, v.t. To cook by dry heat before a fire or over hot stones or metals; now, especially when said of meats, to cook in an oven. See Bake.

Sauté (p.p. of French verb sauter): To brown quickly in a small amount of fat, with frequent turning. Used in America as a verbal infinitive meaning to fry in a small amount of fat. See Fry.

Sear, v.t.: To brown the surface of meat by the short application of intense heat; meat is seared for the purpose of developing flavour and improving appearance.

Simmer, v.t.: To cook in any quantity of water below the boiling-point; in cooking, the temperature is approximately 185° Fahrenheit.

Steam, v.t.: To cook in steam with or without pressure.

Stew, n.: A dish made of small pieces of meat simmered in liquid with or without vegetables.

Stew, v.t.: To cook with a simmering heat. See Simmer.

Stock, n.: Liquid in which meat and sometimes vegetables have been cooked; used in making soups, gravies, sauces, &c. It contains extractives, soluble proteins especially gelatine, flavouring-materials; it may or may not contain fat.

✣ ✣ ✣

The results are :—

Dairy-cow Judging Competition.

C. Riddell (Paengaroa Y.F.C.), 1.
R. F. Walford (Katikati Y.F.C.), 2.
G. Conway (Paengaroa Y.F.C.), 3.

Bacon-pig Judging Competition.

D. Rae (Waimana Y.F.C.), 1.
C. Hamilton (Tauranga Y.F.C.), 2.
G. Conway (Paengaroa Y.F.C.), 3.

The writer desires to record his grateful thanks to all who contributed either directly or indirectly to the undoubted success of the competitions. Special thanks are due to Messrs. Wright, Stephenson, and Co., Ltd., as donors of a challenge cup, to the executive of the Whakatane Agricultural and Pastoral Show for much encouragement and other material assistance, and to Messrs. T. W. Wardlaw and J. Rae for the use of their stock for judging purposes.

Young Farmers' Clubs in Great Britain.

THE regard in which the Young Farmers' Clubs movement is held in Great Britain is exemplified in the following extract from an English paper :—

"That the Young Farmers' Club movement is the greatest force in the country to resist the drift from the land was the view expressed by Mr. Herwald Ramsbotham, Minister of Pensions, when he addressed the annual general meeting of the National Federation in London on Thursday.

"Mr. Ramsbotham went on to say that when he was on the Board of Education the greatest difficulty of continuing rural education after school-leaving age was brought home to him, but that the growth of the Y.F.C. movement had supplied a solution. It was just as important for young farmers to have a thorough technical knowledge of their job as it was for those who worked in factories. In a survey of Great Britain's agricultural problems, the activities of the Clubs was the brightest spot."

It is of interest to note that the last annual report of the National Federation of Young Farmers' Clubs discloses that there are now 355 individual clubs in England and Wales, with a total membership, including associate members, of more than fifteen thousand.

Truck Farming in North Otago.

I. T. SMITH, Secretary, Palmerston South Club.

THE American style of truck farming is a form of farming seldom seen in this part of the South Island, and it is probably one of the most unusual types of farming there is. To begin with, little, if any, live-stock is kept, and all the produce is carted off the farm either to the nearest railway-siding or by motor-truck direct to the consumer. Truck farms are generally small, ranging between 50 acres and 100 acres, and as every acre is under cultivation there is ample work for two or more men all the year round.

Sometimes a few cows are kept, mainly, I think, to keep the "house going," as the income of these farms is nearly always in the late fall when the crops are harvested.

On a small farm it does not pay to keep horses, as the land used in growing chaff, oats, and grass, &c., for them to eat could be profitably growing a crop for the owner's financial benefit. As horses are out of the question it is only natural that the farmer turns to the tractor, and there is one type that is ideal for this class of farming. There are various makes of tractors, all very good, and the three-wheel model with the back wheels movable along the axle to suit the different widths of the drills or rows is most suitable.

A first-class heavy land is essential, as also is a good range of implements. A digger plough is undoubtedly the best type of plough to use, because it is advisable to plough deeply. The digger combines this feature with a breaking-up motion, and one must have a good depth of free soil to enable the plants to grow freely and to use the moisture the soil naturally holds longer. It is my honest opinion that deep ploughing is half of the working up, and it follows that there is a corresponding increase in yield.

Part of Mr. Smith's swede crop, which has been grown for trucking purposes.

Lucerne is grown chiefly for hay, because there are generally at least three cuts of hay, and in a season like this baled lucerne hay proves to be a profitable undertaking.

Swedes for stock feed are trucked for any distance up to two hundred miles, and with a good crop of turnips the grower should be considerably in pocket at the end of the year if there is a favourable season. In connection with turnips, it is our practice to buy old gummy ewes in the late autumn and pull their teeth if they have any left so that they will not bark the swedes. The sheep are then put on to the turnips to eat the

tops, which would be otherwise wasted as a food, and they are nearly always sent away fat by the time the turnip season is finished.

Wheat, oats, and barley have recognized prices, and these crops should be grown in rotation with the green crops. Carrots are grown in some cases, although not in large quantities, because there is much more work entailed in their cultivation. There is generally a great demand for them, principally to rabbiters who are endeavouring to reduce the rabbit population by poisoning.

Potatoes are grown universally by the truck farmers, who sometimes have anything up to 10 acres or more. After they are dug it is advisable to hold them if storage space is available, until the demand is greater, with the resultant high prices.

Praise for Y.F.C. Students at Lincoln College.

"WE would be grateful if in some way you could indicate to the Federation how impressed we are with the quality of the young farmers who are entering upon the college farming courses. We trust that an increasing number will be enabled to derive the benefits of contact with this centre of scientific and practical agriculture, and that the Federation will continue to guide and assist in the development of these farmers of the future."

Such is the appreciation expressed by the Canterbury Agricultural College Old Students' Association in a letter to the chairman of the Otago and Southland Council of the Federation, Mr. A. C. Cameron, dealing with this year's Lincoln Scholarship.

"It was very gratifying to learn that twenty young farmers had made the effort to secure this scholarship," continues the letter. "It is pleasing indeed that such interest is being taken by members of your Federation in the college farming courses. We are particularly glad, also, that partly as a result of our scholarship such a firm as the Southland Frozen Meat Co., Ltd., has generously decided to assist other members to enter Lincoln.

"The students who have entered the college as a result of the work of your selection committee over the period of the past three years have been outstanding in diligence, leadership, and influence. They are the very best type of student whom we have in the diploma farming courses. Accordingly, I have been instructed by the executive committee of the association to extend to you again our appreciation for the continued good work of your association committee, and to assure you that all at the college are greatly impressed with the calibre of the young farmers who are being enabled to enter the courses which are available.

"I may say at this stage that the first winner of the Old Students' Scholarship, J. W. T. Anstey (1937), of Hunter, has just completed his two year diploma course and has gone back to the land. Anstey was the first of the young farmers to enter the college, and he has been followed by all the others who were assisted by your Federation or by the meat companies or who came on their own resources as a result of the interest which had been created.

"We have written to Anstey congratulating him upon his record, which, during his two years at Lincoln, included the college athletic championship, the tennis championship, and runner-up for the College Gold Medal, which is awarded to the leading diploma student. He exerted a good influence among his fellow-students, and has set a standard of diligence and leadership which his successors will not find easy to equal."

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Y.F.C. Broadcasts from 2YA.

THE following Y.F.C. broadcasts are conducted fortnightly from Station 2YA on Tuesdays from 7.40 p.m. to 8 p.m.

May 2nd: "Winter Milk-production," by K. G. Lattimer, Chairman of the Karawaka Y.F.C.

May 16th: "Crops," by J. D. Woodley and D. Lynch, Fitzherbert Y.F.C.

May 30th: "Practical Farm Plantations," by members of the Hunterville Y.F.C.

June 13th: "Piggery Layouts," by A. O'Sullivan, A. Johnson, and W. Brunton, of Cardiff Y.F.C.

Dannevirke Club's Cricket Match.

K. BATEMAN, Dannevirke Club.

A CRICKET match was played on 26th February between two teams picked from members of the Dannevirke Club, one team being captained by S. K. Carswill and the other by G. N. Buchanan.

The match was played on the Dannevirke Showgrounds, and the result was a win for Carswill's team, which scored 242 runs against the 138 runs scored by Buchanan's team.

Ideal weather conditions prevailed.

Bowled middle stump—an incident in the Dannevirke Y.F.C. cricket match.

Western Bay of Plenty Field Day.

A. V. ALLO, District Secretary, Tauranga.

Members judging the dairy cows at the Western Bay of Plenty District Committee's field-day.

ARRANGED by the Western Bay of Plenty Committee, a successful field-day was held on the farm of Mr. T. Comber, Gate Pa, on 11th February, consisting of stock-judging and demonstrations.

More than one hundred club members and supporters were present, all clubs being well represented. Five club members travelled nearly seventy miles to attend.

After lunch, which was provided by the District Committee, club members judged the bacon pigs and dairy cows. When the judging was completed, Mr. D. S. Ross, District Chairman, demonstrated on the pigs and gave an address on bacon-production and points of a baconer.

Mr. F. H. Hartstone, official demonstrator to the Tauranga Jersey Club, gave an interesting demonstration of the Jersey cows, and Mr. J. H. Lever, Otumoetai, demonstrated a Jersey bull.

Afternoon tea was then served, concluding a very interesting day, the first of its type ever held in the Bay of Plenty.

Stock were provided by Mr. G. Hynds, Gate Pa (bacon pigs), and Mr. T. Comber, Gate Pa (Jersey cows).

The prize-winners were—

Bacon Pigs.—D. Thomas, Katikati, 1; E. Pinker, Paengaroa, 2; B. Caldwell, Te Puke, 3.

Dairy Cows.—C. Hamilton, Tauranga, 1; R. Walford, Katikati, 2; C. Riddell, Paengaroa, 3.

New Clubs Formed.

THE following new clubs have been formed during the past two months:—

Eastern Southland District.—Balfour; Five Rivers; and Maitland.
North Taranaki District.—Inglewood; Mangamahoe; Mangorei; and Tikorangi.
Wanganui District.—Mangaweka.
Southern Hawke's Bay District.—Hastings.
Northern Hawke's Bay District.—Matapiro.
Waikato District.—Tahuna.
Auckland District.—Franklin.
Warkworth District.—Port Albert.

This brings the Dominion total up to 184 clubs, 72 being situated in the South Island and 112 in the North Island.

Two Y.F.C. Weddings at Dannevirke.

K. BATEMAN, Dannevirke Club.

MR. G. N. BUCHANAN, of Waitahuna, Dannevirke, a prominent member and committeeman of the Dannevirke Young Farmers' Club, was recently married to Miss Mary Booth, daughter of Mr. and Mrs. W. H. Booth, "Middle Run," Carterton.

Prior to the wedding the club members met Mr. Buchanan in the Farmers' Union meeting-room, where the District Secretary, Mr. J. W. Palmer, Department of Agriculture, on behalf of the club, presented Mr. Buchanan with a barometer bearing an inscription in the form of the circular Y.F.C. badge.

The opportunity was taken by members to wish both Mr. Buchanan and his future wife the best of luck.

Chairman Married.

The Chairman of the Dannevirke Young Farmers' Club, Mr. T. P. Blyth, was recently married to Miss Betty Wilson, daughter of Dr. and Mrs. Alexander Wilson, of Wanganui. Members of the Dannevirke Club met in full force on the previous Saturday evening to wish him good luck and happiness.

Mr. G. N. Buchanan.

The District Secretary, Mr. J. W. Palmer, Department of Agriculture, Hastings, commended the good work done by Mr. Blyth in promoting the welfare of the club in Dannevirke, and wished him every success and happiness in his married life. Other speakers included Messrs. H. S. M. Quigley (secretary of the Dannevirke A. and P. Association and of the Farmers' Union), G. J. J. Buchanan, L. Feierabend, Selby Thompson, Norman Buchanan, and L. Tickner.

Mr. Blyth was presented on behalf of the club with a beautifully mounted barometer and thermometer.

Mr. Blyth thanked members for their kindness and good wishes, and stated that he would continue to do all he could to make the club a great success.

Both Mr. Palmer and Mr. Quigley spoke of the wonderful progress and usefulness of the club, and stressed the value of having so many young farmers meeting together regularly for instructional and social purposes. Mr. Quigley assured members that they had the continued good will of the A. and P. Association and the Farmers' Union.

Mr. Palmer was thanked for making a special trip from Hastings to be present at the gathering.

Among the Clubs: Reports on Activities.

MOST of the clubs have held their annual meetings during March, but many of the reports are not yet to hand. On this account the full list of clubs, indicating secretaries, &c., has been held over until next month, as it is possible that the remaining reports, when received, will reveal a number of changes in officers.

Western Southland.

Dipton.—Annual meeting. Decided to hold a concert and dance in an endeavour to assist finance. Officers elected: Advisory President, Mr. D. McDonald; Advisory Members, Messrs. D. MacRae and T. Nevin; Club Chairman, A. Mudie; Secretary, J. R. Palmer (re-elected); Treasurer, M. English. The latter part of the meeting was devoted to discussing means of making club meetings more attractive. At the conclusion members adjourned to the library, where they were entertained at supper by members of the W.D.F.U.

Thornbury.—Special meeting to elect a secretary to replace Mr. G. A. Fallow, who has taken on a Lincoln College Scholarship. Mr. K. E. McKenzie was elected to fill the position.

Woodlands.—Annual meeting. Officers elected: Advisory President, Mr. J. Middlemiss; Club Chairman, A. Campbell; Secretary, L. Middlemiss; Treasurer, H. McKenzie. At a previously unreported meeting practical demonstrations were given on a stud Romney ram and a stud Southdown ram by Messrs. W. E. Hunt and J. V. Watson respectively, followed by a talk on "Stock-judging" by Mr. Gibson Smith, of Dacre.

South Otago.

Balfour.—Discussion on proposed North Island tour. Lantern lecture by Mr. S. D. Blomfield, Dominion Fertilizers, Ltd., on "Pasture Management."

Clinton.—Club debate, the subject being "That Farmers should Marry." The speakers were E. Rosevere and C. Turnbull (affirmative), R. Roy and C. McLauchlin (negative). The affirmative supporters were awarded the decision by a narrow margin. The debate was followed by impromptu speeches by club members.

Lawrence.—Lecture by Mr. A. F. Greenall, Department of Agriculture.

Milton.—Annual meeting. Officers elected: Advisory President, Mr. A. B. Stewart; Club Chairman, R. Bransgrove; Secretary and Treasurer, D. Tweedie.

Central Otago.

Arrowtown.—Addresses by Messrs. Watson and Mathieson, visiting Australian farmers, on "Farming Conditions in Australia."

Roxburgh.—Annual meeting. Officers elected: Advisory President, Mr. R. T. Kinaston; Club Chairman, L. Henderson; Secretary and Treasurer, L. George.

Dunedin.

South Taieri.—Report by Club Secretary on the recent meeting of the District Executive; discussion ensued. Preliminary arrangements made for a ploughing match in May.

North Otago.

Enfield.—Business discussion. Decided on a general canvass for new members. An interesting bulletin of the Canterbury Chamber of Commerce on the subject of "Tractors" was read by B. A. Johnston (Chairman), followed by discussion.

Ashburton.

Ashburton.—Short talk by R. Hamilton (club member) on "The Mating of a Cock Pheasant with Bantams." Lecture by Mr. Leigh on "Trees in the Domain."

Mayfield.—Proposal for field-day in April; subcommittee set up to arrange programme and date and to report to next meeting. Advisory President and Chairman congratulated the debating team on their performance at the inter-club debate held at Methven; the team leader, R. M. Mulligan, replied. Addresses by Mr. G. B. Murdoch on "Artificial Insemination" and Mr. J. W. Kingan on "Lucerne Growing." Short talk on "The Electric Fence" by E. H. Mulligan (club member). Questions were submitted to the meeting by K. Moore (club member).

Christchurch.

Dunsandel.—Annual meeting. Officers elected: Advisory President, Mr. H. Wright; Club Chairman, D. H. Johnston; Secretary, A. T. Wright; Treasurers, W. Nicol and N. J. Brown.

Ellesmere.—Annual meeting. Officers elected: Advisory President, Mr. G. W. R. Osborne; Club Chairman, L. C. Coe; Secretary, D. Hurford; Treasurer, D. G. McLure.

Little River.—Annual meeting. Officers elected: Advisory President, Mr. E. E. Patten; Club Chairman, R. J. Chapman.

Marlborough.

Blenheim.—Discussion *re* proposed district tour. Impromptu speeches; each member submitted a subject or a question. These were drawn by members from a hat, speakers being allowed three minutes in which to prepare their talk. At previously unreported meetings Mr. Palk spoke on "Farm Accountancy," and included "Land and Income Tax, and Social Security Papers"; and Mr. Gough, an English farmer, addressed the meeting on "Young Farmers' Clubs in England," also giving his impressions of New Zealand farming and a few points of English farming procedure.

Wairarapa.

Alfredton.—Annual meeting. Officers elected: Advisory President, Mr. J. L. Heckler; Club Chairman, E. Edmonds; Secretary, N. C. Napier; Treasurer, W. Heckler.

Ballance.—Annual meeting. Officers elected: Advisory President, Mr. R. A. Burke; Club Chairman, J. F. Bremner; Secretary, H. C. Wilton; Treasurer, Mr. Ross.

Carterton.—Annual meeting. M. Knutson elected Secretary.

Featherston.—Annual meeting. Discussion concerning programme for ensuing year.

Greytown.—Annual meeting. Officers elected: Advisory President, Mr. R. Tilson; Club Chairman, J. Yoeman; Secretary, V. Gates; Treasurer, G. Montgomery. Donation received from Mr. R. Beu; Mr. Knowles donated rubber stamps. At the previous

meeting the Y.F.C. camps were discussed, and also the proposed district tour. A very successful "Question Evening" was held, the response from members being excellent.

Mangatainoka.—Annual meeting. Officers elected: Advisory President, Mr. F. G. Ward; Club Chairman, G. H. Cotter; Secretary and Treasurer, H. McG. Rentoul.

Masterton.—Annual meeting. Officers elected: Advisory President, Mr. W. James; Club Chairman, J. Coom; Secretary, C. A. Mackay; Treasurer, Ken McGillivray. At this meeting Mr. W. F. McLaren, who is Immediate Past President of the Federation, and who has been associated with the Masterton Club since its inception in December, 1934, was elected a life member of the club.

Tinui.—Annual meeting. Officers elected: Advisory President, Mr. J. Speedy; Club Chairman, P. Balfour; Secretary and Treasurer, R. Spooner.

Manawatu.

Bunnythorpe.—Annual meeting. Officers elected: Advisory President, Mr. J. Linklater; Club Chairman, J. Wood; Secretary and Treasurer, MacGregor Donald.

Feilding.—Annual meeting. Officers elected: Advisory President, Mr. H. Brewster; Club Chairman, R. Mason; Secretary and Treasurer, R. W. Durrant. At the conclusion of the business a lecture was given by Mr. H. de O. Chamberlain, Department of Agriculture, on "Top-dressing."

Fitzherbert.—Annual meeting. Officers elected: Advisory President, Mr. Harrison; Club Chairman, N. James; Secretary and Treasurer, J. D. Woodley. A general discussion regarding a suggested imposition of fines for absent members; there was a strong feeling against the adoption of such a system. Arrangements were made for a club cricket match, Aokautere members *v.* Linton members.

Johnsonville.—Annual meeting. Officers elected: Advisory President, Mr. A. Horrobin; Club Chairman, H. Ahradsen; Secretary, G. Bryant; Treasurer, P. Smith.

Kairanga.—Meeting held partly as a social function. Mr. E. Bruce Levy, Director, Grasslands Division, Plant Research Bureau, gave an interesting address, illustrated by lantern slides, on "Farming Overseas." A number of vocal and instrumental items were rendered by members and friends, and novelty dances and community singing continued until a late hour. The evening was a great success, there being an attendance of over sixty members and friends.

Kimbolton-Kiwitea.—Inauguration of club-membership drive. Address by Mr. F. H. Billing, of Kimbolton, on "Book-keeping, Farm Accounts, and the Law relating to Cheques."

Levin.—Discussion on judging competitions at Shannon sports; decided to enter two teams. Arrangements for a visit to General Motors Assembly Works and the Gear Meat Co. Lantern lecture by Mr. E. Bruce Levy, Director, Grasslands Division, Plant Research Bureau, on "Farming Overseas." The meeting was run as a "Father's Evening," members being asked to bring their fathers in order to give them an inside knowledge of club work and activities. The meeting proved very popular, more than twenty visitors being present.

Oroua Downs.—Annual meeting. Officers elected: Advisory President, Mr. R. Craig; Club Chairman, A. Nichols; Secretary and Treasurer, J. E. Dench.

Rangiwahia.—Annual meeting. Officers elected: Advisory President, Mr. Billinghurst; Club Chairman, M. Wood; Secretary and Treasurer, K. O'Dwyer.

Pohangina Valley.—Films on agricultural subjects exhibited by Mr. G. S. Robinson, Department of Agriculture.

Shannon.—Annual meeting. Officers elected: Advisory President, Mr. C. Guerin; Club Chairman, N. Guerin; Secretary and Treasurer, C. Watson.

Whakarongo.—Annual meeting. Officers elected: Advisory President, Mr. R. G. Scott; Club Chairman, B. Dickson; Secretary, R. G. Scott, jun.; Treasurer, E. Morris.

Woodville.—Discussion *re* proposed Y.F.C. camp at Hastings. Lecture by Mr. H. B. Low on "Land-values."

Wanganui.

Bulls.—Annual meeting. Officers elected; Advisory President, Mr. C. E. Vile; Club Chairman, S. G. Avery; Secretary, S. H. Last-Harris; Treasurer, C. S. Harris.

Mangaweka.—Address by Mr. H. Weymouth on "How to Conduct a Meeting."

Marton.—Meeting supported suggestions put forward by the Wellington Council Secretary at the last Council meeting. Arrangements for a field-day. Report by Chairman on the stock-judging competitions at the recent Marton A. and P. Show; the competitions proved a great success. Short talks by members as follows: "Ensilage" (F. H. Smith); "Eradication of Gorse" (L. McLeay); "Fencing" (R. Shield); "Pig Lay-out" (F. L. Smith); "General Appearance of Farms" (J. M. Cranstone).

Westmere.—Recommendations to District Committee that a motto should encircle the pocket badge on Y.F.C. blazers, that the enamel lapel badges remain as they are, and that a Y.F.C. tie should be adopted. Arranged for a party of club members to meet the North Taranaki touring party at Kai Iwi and accompany them to Mr. G. F. Moore's property, "Bushey Park." Club radio talk on "Fencing" read and discussed. Arrangements finalized for a cricket match *v.* the Farmers' Union. At the previous meeting F. Davies (a club member) addressed the meeting on his holiday in Honolulu, dealing in particular with the pineapple-canning industry, the sugar-cane plantations, and a dairy which he visited.

South Taranaki.

Alton.—Arrangements for the annual sports meeting and dance. Date fixed and judge appointed for calf-judging competition. Lecture by Mr. Ramsbottom, of Patea, on his tour of England, the speaker making a comparison of English and New Zealand farming methods. A short discussion was held on the proposed Australian tour by South Taranaki members. A social evening, including community singing, followed.

Eltham.—Discussion *re* the forthcoming Y.F.C. camp at Hastings and the proposed trip to Australia. Arrangements for a return cricket match with the Pukengahu Club. M. Tarrant (club member) was congratulated on the able manner in which he broadcasted the club radio talk on "Top-dressing" on 7th March. Address by Mr. Hessel, of Eltham, on "Farm Law." The annual picnic was held on 9th March, a number of athletic events being undertaken, including 100 yards, 220 yards, and 440 yards handicap, both for members and open; long jumps, throwing the cricket ball, boys' cycle race, men's half-mile cycle race, tilting-the-ring in cars, clock-golf, nail-driving, chain-stepping, &c. A dance was held in the evening, when trophies won during the day were presented by the district Y.F.C. Secretary, Mr. J. E. Davies. An attendance of more than three hundred was recorded.

Hawera.—Lecture by Mr. P. Trim on "The Propagation of Fruit-trees," the speaker explained and demonstrated the different methods of grafting and budding. A visit was made to the Patea Freezing Co.'s works, a party of eighteen members being conducted over the works by Mr. Pettigrew, the company's secretary.

Kaponga.—Annual meeting. Officers elected: Advisory President, Mr. C. P. Gordge; Club Chairman, P. Edgecombe; Secretary and Treasurer, J. Kissick. Cricket match *v.* Pukengahu Club resulted in a win for Kaponga by 86 runs to 53.

Whakamara.—Discussion *re* forthcoming Hastings educational week. Talk by the Club Chairman on the recent visit to the Wanganui wool-store and wool-sale; Mr. L. Caldwell classed some of the specimens of wool for the benefit of those who had not been able to undertake the visit.

Whenuakura.—Annual meeting. Officers elected: Advisory President, Mr Lee Honeyfield; Club Chairman, W. Honeyfield; Secretary, J. Fairweather; Treasurer, J. Derrett.

North Taranaki.

Cardiff.—Five teams picked to judge in the Y.F.C. stock-judging competitions at New Plymouth Autumn show. Mr. A. O'Sullivan congratulated the Cardiff A team on winning the stock-judging at Stratford Show last November. Address by Mr. G. A. Blake, Department of Agriculture, on "Pig Lay-outs"; Mr. Blake's object was to prepare members for a radio talk to be broadcast later in the year.

Hillsborough-Tarurutangi.—Club debate, the subject being "Hay and Roots *v.* Hay and Silage." At previously unreported meetings addresses were given by Mr. R. P. Anderson on his activities at Massey College and Mr. A. G. Elliott, Department of Agriculture, on "Pastures, Hay, and Silage."

Inglewood.—Films exhibited, "From Meadow to Market" and "How to Grow Hogs." Mr. C. J.

MASSEY COLLEGE.

SHORT COURSES 1939.

WOOL CLASSING: 9th May to 21st July, or 6th October.

SHEEP FARMING: 22nd May to 13th June.

DAIRY FARMING: 19th June to 30th June.

HERD TESTING: 4th July to 21st July.

ANNUAL MEETING OF SHEEP FARMERS 7th, 8th, 9th JUNE.

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Hamblyn, Fields Superintendent, Department of Agriculture, addressed the meeting on Y.F.C. matters generally. Mr. A. Paynter, of Blenheim, gave a comparison of farming in Marlborough and Taranaki. Mr. D. O'Sullivan (Jersey breeder), of Inglewood, spoke specially to those members who had taken part in the recent Jersey Club's field-day.

Mangamahoe.—Discussion *re* forthcoming district tour of North Island. Comments on the judging competitions at the New Plymouth show. Address by Mr. N. G. Ross, manager of the Mangorei Dairy Factory, on "Grading, and the Manufacture of Butter."

Mangorei.—Demonstration by Mr. Pearce on "Dairy Type in Cows." Mr. Pearce used cows from his own herd to illustrate the points he desired to stress; the demonstration was given in preparation for the stock-judging at the New Plymouth Show.

Okau-Tongaporutu.—Discussion on club activities generally. Mr. A. G. Elliott, Department of Agriculture, congratulated the club on winning the stock-judging competition at the New Plymouth Show. Mr. E. Foreman and N. Bishell (club member) gave talks on the recent visit to the Waitara Freezing-works.

Tikorangi.—Talk by Mr. G. A. Blake, District Y.F.C. Secretary, on club matters generally. Address by L. A. Alexander on "Pig Management, and the Cost of Keeping Pigs Through the Winter Months." Members of the Farmers' Union were present by invitation.

Toko.—Selection of teams for stock-judging. Discussion *re* sports meeting to be held on 1st April. Club members had assisted the W.D.F.U. in running their annual sports meeting in February, and in return the W.D.F.U. will assist the club at the forthcoming gathering, in which neighbouring clubs will participate.

Southern Hawke's Bay.

Dannevirke.—Letters from Dominion Organizing Secretary, Mr. S. Freeman, congratulating the club on its very fine effort in conducting the special Y.F.C. stock classes at the recent Dannevirke A. and P. Show. Discussion *re* Y.F.C. members acting as junior judges at A. and P. shows; list of suitable members to be prepared, and the A. and P. Association to be asked to appoint them as associate judges. Mr. G. J. J. Buchanan was thanked for his donation of a fat wether for the weight-guessing competition at the show. The proceeds from this competition are to be divided between the club and the Women's Rest-room Fund. The money received by the club is to be set aside for a cup, to be called the "Buchanan Cup," for a competition to be arranged later. Mr. J. W. Palmer, Department of Agriculture, raised the point of baled-hay classes at the show. It was agreed that an effort be made to encourage young farmers to compete strongly in this section at future shows. Mr. Palmer gave an interesting talk on "Pasture Management," touching on the use of fertilizers, the need for the use of certified seed, and various other aspects.

Hastings.—Lecture on "Grassland Management" by Mr. J. W. Palmer, Department of Agriculture.

Norsewood.—Lecture by Mr. Pattison on "Herd-testing."

Onga Onga.—Members of the club journeyed to Hastings and paid a visit to the Tomoana Freezing-works, where the manager, Mr. Kirkpatrick, showed them round. Wattie's Canneries were then inspected, and a visit was also paid to Messrs. Williams and Kettle's seed-dressing station. Nineteen members took part in the trip.

Takapau.—Arrangements for a dance. Lecture by Captain Selby on "Territorials in New Zealand." The interest taken in the subject was shown by the number of questions asked at the completion of the talk.

Northern Hawke's Bay.

Matapiro.—Officers elected: Advisory President, Mr. A. W. Whyte; Club Chairman, D. Beamish; Secretary, H. Pearce; Treasurer, R. Doole.

Meeanee.—Business meeting. Programme for sports meeting put before members by Sports Committee and approved. Ladies' Hall Fund Committee granted permission to have a stall on the grounds, provided no goods stocked that would compete with the catering. Three new members elected, bringing the club membership up to fifty-four.

Putorino.—Business meeting. Arrangements for annual meeting, 28th March. Discussion *re* field-days and tour. Cost of supper after meetings to be defrayed from club funds. Short talks by members to be encouraged and as many as possible given at each meeting, members to be in readiness when called upon.

Poverty Bay.

Te Karaka.—Address by T. A. Phillips entitled "Some Impressions of Older Lands." Mr. Phillips spoke briefly of London, Gretna Green, Ireland, Norway, Sweden, Finland, Danzig, and the United States of America.

Tolaga Bay.—Address by Mr. E. M. Bates, District Y.F.C. Secretary, on "The Y.F.C. Movement." Arrangements for a dance. Annual meeting to be held on 18th March. Impromptu speeches made by members. At the previous meeting the following talks were given: "Permanent Water-supply from Springs" (Mr. J. Robison); "How to Build a Concrete Tank, using an Old Tank as a Mould" (Mr. T. Post), and "How to Build a Brick and Concrete Trough" (Mr. L. Donald). A general discussion on different methods of farm draining followed.

Taumarunui.

Taumarunui.—Annual meeting. Officers elected: Advisory President, Mr. T. Duncan; Club Chairman, A. Harvey; Secretary, L. G. Smith; Treasurer, L. McKinnon. Members visited the Ohura Show and took part in a judging competition on dairy cows; demonstrations were given by the show judges on dairy cattle and Romney sheep. A visit was also paid to the farm of Mr. C. G. Thurston, Hikumutu, where demonstrations were given on Romney sheep; a judging competition among members created quite an interest. Afternoon tea was provided.

Te Kuiti.

Aria.—Messrs. C. Walker and K. M. Montgomery, Department of Agriculture, exhibited sound films on agricultural subjects.

Otorohanga.—Business meeting. Discussion *re* programme of lectures, demonstrations, &c. Instructions to delegates to Council meeting. The following field-days were held recently—On Mr. S. Rankin's farm: demonstration by Mr. Rankin on Clydesdale horses; on Messrs. Tipping Bros.' farm: demonstration by the Advisory President, Mr. S. K. Tipping, on the judging of Romney sheep, also an inspection of a pick-up hay-press; on Mr. R. Sanderson's farm: demonstration on the judging of Jersey cows by Mr. Sanderson, and the judging of bacon pigs by Mr. R. Davis. A stock-judging competition was held at the Otorohanga A. and P. Show, sixteen local club members competing, together with eleven members from the Aria and Te Anga Clubs. R. Doe (Te Anga) won the first prize of £1, together with a miniature cup presented by Mr. K. F. O. Smith, and holds the F.A.C. Challenge Cup for the year; R. Miln (Te Anga) won the second prize of 10s.; and O. Gordon (Te Anga) tied with J. Croasdale (Otorohanga) for third place. Very keen public interest was aroused in the competition. On Saturday, 11th March, a team from the Kakepuku Club played a match with the Otorohanga Club on the Otorohanga Domain. Each side played fourteen men. Otorohanga made 99 runs in the first innings and 14 runs in the second innings without the loss of a wicket. Kakepuku made 28 and 79 runs. Otorohanga won with 13 wickets in hand.

Eastern Bay of Plenty.

Edgecumbe.—Discussion on proposed tour. Final arrangements for debate against the Taneatua Club. Sound films were exhibited by Messrs. C. Walker and C. R. Taylor, Department of Agriculture, dealing with "Caterpillar Tractors" and "Seed Germination."

Opotiki.—Arrangements for a practice debate in preparation for the district debating competition; subject chosen, "That the Flat Country between Tablelands and Woodlands is better for all-round Farming than Tablelands, Woodlands, and Paerata." Discussion *re* programmes of lectures, &c.

Taneatua.—Business meeting. Practice debate arranged. Date fixed for annual meeting.

Waimana.—Annual meeting. Officers elected: Advisory President, Mr. N. Macdonald; Club Chairman, L. Macdonald; Secretary, D. Woolfield; Treasurer, R. A. Bell.

Western Bay of Plenty.

Katikati.—Annual meeting. Officers elected: Advisory President, Mr. H. Capamagian; Club Chairman, R. F. Walford; Secretary, T. J. Pamment; Treasurer, J. B. Sutton.

Omokoroa.—Lecture on "Malpresentation" by Mr. F. Keam.

Paengaroa.—Programme finalized for the club picnic sports; a dance to be held in the evening. Prizes and trophies donated for twenty-two events. Special meeting to be held to select debating teams. Address by Mr. Alan Jordan, of Tauranga, on "The Tea Industry and Big Game Hunting in Ceylon"; also an address by Mr. Peter Hutt, formerly of Malay, on "The Rubber Industry in Malay; the Life of a Sinaderi on a Plantation."

Te Puke.—Business meeting. Arrangements for a debate. Date of annual meeting fixed for 24th March.

Waihi.—Practice debate; subject, "That the Introduction of Machinery has done more Harm than Good." Each member spoke for the negative, and Mr. A. H. Blackmore put forward the argument for the affirmative. At the annual meeting the following officers were elected: Advisory Prssident, Mr. H. Edwards; Club Chairman, A. Sutton; Secretary, A. Blackmore; Treasurer, M. Robinson.

Rotorua.

Horohoro.—Business meeting. Arrangements for proposed tour of East Coast district—Ruatoki, Te Kaha, Tikitiki, and Mohaka development schemes: the tour will take six days, commencing on 4th June.

Putaruru.—Business meeting. Discussion with regard to increasing membership and canvassing the district, also in regard to Ruakura Y.F.C. rally, the proposed district tour, radio talks, debates, and the Y.F.C. court at the Waikato Winter Show, &c. Arrangements for attending the Jersey breeders' demonstration; also for a stack-building competition.

Waikato.

Kakepuku.—Mr. E. R. Marryatt, Department of Agriculture, Ruakura, gave a lantern lecture on "Feed Flavour Control, and the Control and Management of Pastures." Mr. A. C. Burgess, also of Ruakura, gave a lecture on "Top-dressing."

Tahuna.—Discussion *re* raising of funds and also gaining publicity for the club. Dance to be held; sub-committee appointed. Address by Mr. I. R. F. Campbell, of Morrinsville, on "The Mode of Meeting Procedure."

Te Kowhai.—Address by Mr. T. E. Rodda, Manager, Ruakura Farm (Department of Agriculture), on "Farm Forestry." This was followed by a general discussion of farming topics.

Auckland.

Mangatawhiri.—Arrangements for a dance. Discussion *re* scholarship; members to forward their applications before next meeting. Club debate, the subject being "Sheep-farming *v.* Dairy-farming." Four speakers took part on each side; the judge gave the award to the supporters of dairy-farming.

Whangarei.

Maungakaramea.—Annual meeting. Officers elected: Advisory President, Mr. R. N. Attwood; Club Chairman, C. W. Timperley; Secretary and Treasurer, G. R. Porter. At the previous meeting an impromptu debate was held, the subject being "That Sheep-farmers have a Harder Life than Dairy-farmers."

Dargaville.

Arapohue.—The District Y.F.C. Secretary, Mr. E. H. Arnold, outlined the proposed tour of South Auckland and Bay of Plenty, finishing up at the Y.F.C. rally at Ruakura in July. Arrangements made for a field-day at Paparoa, with stock demonstrations and judging competitions. A number of questions on farming subjects were asked and discussed.

Marohemo.—Annual meeting. Officers elected: Advisory President, Mr. J. Roadley; Club Chairman, J. Petrie; Secretary, L. Maras; Treasurer, J. Brooks.

Ruawai.—Business meeting. Discussion *re* club activities. The District Y.F.C. Secretary, Mr. E. H. Arnold, outlined the proposed district tour, and also submitted a programme to assist the club with debating, &c.

Kaitaia.

Broadwood.—Impromptu speeches by club members as follows: "Management of Paspalum" (J. McKenzie); "Farming in New South Wales" (D. Newman); "Management of Hill Country" (F. Hick); "Handling of Ewes and Lambs" (C. McKenzie); "Pigs at Paerata College" (A. Copland).

Kaitaia.—Discussion on the proposed winter tour to South Auckland and Bay of Plenty; also the Y.F.C. rally to be held at Ruakura in July. It was announced that the cup for the bacon-pig-judging competition at the Mangonui A. and P. Show was won by J. H. Gray of the Umawera Y.F.C. In the National Bacon-pig championship, pigs exhibited by two members of the Kaitaia Club were placed second and third, judged on the hoof at the Mangonui Show. Lantern lecture by Mr. E. B. Glanville, Department of Agriculture, on "The Consolidated Land Areas"; the speaker showed how these areas can be brought in and made to grow first-class pasture. At the previous meeting Mr. W. A. Beattie, Supervisor, Northland Pig Council, gave a lecture on bacon-pig judging, using diagrams showing the wrong and correct types of pigs. At the annual meeting, held on 22nd March, the following officers were elected: Advisory President, Mr. E. W. Hansen; Club Chairman, H. Hooper; Secretary, T. W. Flinn; Treasurer, A. Jameson.

Oruru.—Lecture by Mr. E. B. Glanville, Department of Agriculture, on "Manures, and Pasture Establishment."

Umawera.—Annual meeting. Officers elected as follows: Advisory President, Mr. K. Harrison; Club Chairman, A. Harrison; Secretary and Treasurer, B. Gray.

Health Notes for the Farm.

Contributed by the Department of Health.

Personal Hygiene and Care of the Body.

FROM a health point of view the terms "cleanliness" and "personal hygiene" are practically the same. Personal hygiene is a distinct aid to health, and therefore to efficiency. There can be no question of its importance—so much so that instruction in personal hygiene is of inestimable value in primary schools in order that life-long habits of right living may be inculcated in each individual.

We may now consider what steps must be taken to keep the various parts of our body in good order.

Care of the Skin.

The skin, by surface radiation and evaporation, regulates the temperature of the body. It is also an excretory organ, as it contains innumerable sweat glands, the ducts of which open on the surface. There are other glands of the skin—sebaceous glands. The skin is therefore exuding sweat and sebaceous matter which, mixed with epidermic scales which have been shed and scurf, accumulates on the surface and must be periodically removed if the body is to be kept in a clean and wholesome condition.

Some of this matter penetrates into the underclothing next to the skin, thus rendering periodical changes of underclothing necessary. Dirty skin and dirty clothes are not only disagreeable to the senses, but they are also injurious to health, as they lessen the excretion of waste materials on the surface of the body and therefore throw more work on the internal excretory organs. Uncleanly people whose skin is too clogged with dirt to perform its function are also more liable to chill than those whose skins are clean.

To keep the skin in good health a warm bath should be taken at least once a week, preferably more often, and at night in order to avoid a chill. Cold baths are less cleansing than hot baths, but they are more stimulating and invigorating. The best time for a cold bath is after rising in the morning. Very young and delicate people do not, as a rule, stand cold baths well, and for them a tepid sponge is preferable.

Swimming-baths are of great value. Not only do they afford opportunity for acquiring a valuable accomplishment, but they provide physical exercise in a form that is most potent for the promotion of health. Where school baths have been instituted they have been found to lead not only to greater cleanliness of underclothing and person among the pupils, but to increased self-reliance, better moral tone, better mental attainment, and most decidely better physical development.

The Feet, &c.

Special attention to the care of the feet is essential, as a large amount of perspiration is given off by the sweat glands on the soles of the feet even in the coldest weather. This, together with the scales which collect in the spaces between the toes, must be daily removed by washing, as the feet otherwise rapidly become offensive.

Other parts of the body which require special attention are those parts where perspiration is most active, such as in the armpit and in the groin. The head should be thoroughly washed at least once a week. Washing is best done with soap and water. If the hair be naturally dry, olive-oil should be rubbed in as soon as the hair is dry. The daily use of water upon the head is not to be recommended; too much of the natural oil is washed out, and falling of the hair is likely to result.

A good deal of the soot and dust in the atmosphere of large towns is prevented from reaching the lungs by becoming lodged in the nasal cavities just within the opening of the nostrils. The nose, therefore, performs the useful function of a filter, but, like other kinds of filters, it should be cleansed periodically. It is important that children should be

Hydatid Disease Reminder

As indicated in the card of instructions accompanying the tablets of an approved remedy for tapeworms in dogs, issued to all dog-owners at the time of dog registration, it is advised that the remedy be given every three months.

If the first dose was given in January the second dose should be given immediately, if this has not already been done.

This reminder is issued by the Department of Health and the Department of Internal Affairs.

taught the proper use of the handkerchief and that they be encouraged at all times to breathe through the nose.

Dirty skin and clothing attract lice. There are two kinds of lice commonly infecting the human body—the head louse (*Pediculus capitis*) and the body louse (*Pediculus corporis*). Both head and body lice are transferred from person to person by close contact or by the wearing of infected caps or clothes. The effect of these vermin is made more serious than would at first appear probable, as the intense irritation inflicts much loss of rest and consequent nervous disturbance on the sufferers.

Head lice are best got rid of by cutting the hair very short and thoroughly saturating it with kerosene overnight. This, of course, should not be done near a naked light. Next morning the hair should be washed thoroughly with soft soap and hot water and then combed with a fine-tooth comb. The removal of nits can be assisted by dipping the comb in warm vinegar. Body lice are destroyed if the garments they infest are baked or disinfected by steam heat.

Lack of personal cleanliness predisposes to skin-diseases, such as ringworm, *impetigo contagiosa*, and scabies or itch. Clean people may become infected from close contact with a sufferer. These conditions demand prompt medical treatment.

Care of the Nails.

Nails should be kept short and their cleanliness ensured by a thorough scrubbing with a nail-brush in hot soapy water. Dirty nails often carry infection to the food. Small children, for instance, often reinfect themselves with threadworms by conveying the ova into their mouths from dirt underneath their finger-nails.

Teeth.

Decayed teeth are a potent cause of disease. Teeth should be brushed after each meal if possible, especially the last thing at night. Meals should be ended by food of a cleansing character—*e.g.*, salivary stimulants such as lettuce, celery, apples.

Clothing.

Clothing should be light and loose so that it does not interfere with free body movement. It should be adapted to the climate and seasons of the year. Underclothing should be changed at least once a week. For young children especially, simple garments are desirable, as they are more readily kept in good order. No child is properly clothed who has not a handkerchief; this is a most important article, both for health and cleanliness.

Dirt decreases physical efficiency and takes away self-respect. Cleanliness not only gives bodily comfort and health, but contributes towards a sense of personal dignity, and hence adds greatly to one's power of achievement—it permits one to "live most and serve best."

Robert Louis Stevenson has said: "I am set up at the cross-roads to warn you; and I say unto you, keep well, and I say to you again and again, keep well."

This is the message for all of us, for as a general rule we are responsible for our own health. When we realize this and appreciate the value of health to economic welfare and happiness we shall be more careful to preserve this our greatest asset. In civilized countries a high standard of personal hygiene is an all-important factor in the prevention of ill-health in town or country, in school, shop, or the home.

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The Farm Home and Kitchen.

Contributed by the Association for Country Education.

Home the Safest Place—*But Is It?*

FALL DOWN STAIRS.

Injuries to his back necessitating his admittance to hospital at 12.30 yesterday afternoon was received by a young man . . . when he fell downstairs at his house . . .

CHILD SCALDED.

Mary . . . , a child residing at . . . was admitted to hospital at 8.30 last night suffering from a scalded left foot as a result of tripping over a kettle of boiling water.

THESE clippings are taken at random from a daily newspaper and yet are typical of hundreds of such notices which appear every year.

Recently we have seen spectacular parades and slogans in a campaign for "Road Safety." It is right that road-users should know the dangers that lurk on the streets, but it is even more necessary that we should realize how many people are accidentally killed, maimed, and injured in and about their homes, so that every one may take steps to prevent such unnecessary suffering and expense.

House accidents have been found to occur most often to women, children, and elderly people, although men are not exempted. Mothers, pre-school children, and old people spend more time at home than do other members of the family, and it is rather ironic that those about whom one can become most sentimental—mother, baby, grandmother, and grandfather—should be the ones exposed to the greatest dangers in what surely should be the safest as well as the "dearest spot on earth"—the home.

Leading Causes.

The leading causes of home accidents are falls, burns and scalds, food and drug poisoning, poisonous gas, mechanical suffocation, and finally a miscellaneous group such as those caused by cutting and piercing instruments, electric currents, firearms, drowning, and household pets.

But the pertinent question is, "How can such accidents be prevented?" For it is surely a self-evident fact that many of them can be prevented.

First let us consider falls. How do they happen?

Highly polished floors, with loose, unanchored mats, children's toys, a broom or a mop left in the middle of the floor or on the stairs, and dark or poorly lighted rooms, halls, and stairs are a few of the most frequent causes; but there are others. Tired and nervous women should especially be cautioned against climbing on chairs, boxes, and tables to hang curtains or pictures, reaching up to high shelves, and climbing up and down stairs with loaded arms.

Make Electricity Safe.

(1) Never run flexible cords under rugs or through doorways. They become worn too quickly.

(2) Never continue to use ragged and worn cords. They may cause short circuits and fire.

(3) Never leave equipment connected when not in use. There is danger of fire when you do.

(4) Never attempt to repair or install electrical equipment yourself. This is a job for the expert.

(5) Never attempt to repair cords when they are "plugged in" to a point. There is danger of an electric shock.

(6) Never touch any electric switch when any part of the body is in contact with water. There is again danger of shock.

(7) Never disconnect equipment by pulling on the cord. This damages connection and cord, which may result in fire or shock.

Matches and Fire.

Playing with matches and fire is the main cause of fatal burns in children. Pulling over utensils containing hot liquids or falling into tubs of boiling water are too often responsible for scalds to infants and toddlers. Surely such things can be forestalled. Matches need never be left within reach of the child too young to understand that they are dangerous playthings, and no homemaker has surely the right to be in too much of a hurry to safeguard a toddler from contact with such dangerous places as the open fire, the hot stove or radiator, or the burning candle or lamp.

Overtiredness, with its attendant mental weariness, is too often the indirect cause of such accidents. How much better, then, to leave a few tasks undone than to be too tired to notice danger in the way?

Here are some questions that should be so constantly in the minds of adults that they are automatic in their answering.

Are matches kept out of reach of children?

Is the fireplace properly guarded?

Are the handles of pots and pans in the stove turned inward?

Are oily rags and such rubbish properly disposed of?

Are inflammable fluids kept away from the fire or flame of any kind?

Are all wooden surfaces planed smooth and free from splinters?

Accidents from Poisoning.

Accidental poisonings are other causes of home fatalities—drugs and poisons carelessly left in reach of inquisitive and venturesome little fingers or where, in an emergency or at night, confused adults may mistake them for something else. If poisons must be kept on hand (and there are some that are household necessities), let them be well labelled " Poison " and kept in a separate shelf out of the reach of toddlers.

Remember, too, that there is truth in the old adage, " It is never too young to learn." Even little folk can be led to understand why certain things must not be handled. Don't be content with just the admonition " Mustn't touch." Explain why.

Children, especially tiny ones, seem to have a fascination for trying to eat anything within reach. Hence the necessity for training ourselves not to leave all sorts of little things lying about on chairs, dressers, and floors.

Accidental deaths caused by cutting and piercing instruments is further too frequent evidence of neglect of ordinary household precautions. Knives, forks, scissors, tins with jagged edges, broken dishes, and glass are all much too dangerous to be allowed to " lie around " the house.

Prevention Better Than Cure.

Prevention is certainly better than cure when it comes to house safety, and the " education " of the family members is one of its first principles.

A house in which every one automatically picks up things dropped on the floor, a home in which poisons are labelled and kept in a special place, a home in which

Home Safety?

In ONE year ONE hospital in ONE New Zealand city reported one hundred and fifty cases admitted as a result of home accidents!

fires are guarded and matches placed out of reach—this is a place of comparative safety. But safer still is the home in which possible accidents are discussed in the family circle and family members are educated to know why not to seek to find a leak in the gas-pipe with the aid of a lighted match and why the electric switch in the bathroom is situated in the roof and not above the wash basin.

After all, why wait to " lock the stable after the horse has been stolen ? "

It is easy to sympathize or to condemn when the accident has occurred in some one else's family, but are we sure that what has happened in that house cannot happen in our own ?

The answer rests with ourselves.

Put a "Starkie" Water Heater behind the Hot taps in your home and enjoy the boon of a copious hot water supply for all requirements throughout the 24 hours of the day!

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Answers to Inquiries.

Recipe for Home-made Soap.

R. M. H. (Whatawhata) :—

Would you kindly publish a good home-made soap recipe containing caustic soda ?

I have been trying a recipe out, but the result is not altogether satisfactory, and I think perhaps the quantities are not quite right.

The following is a good recipe for home-made soap :—

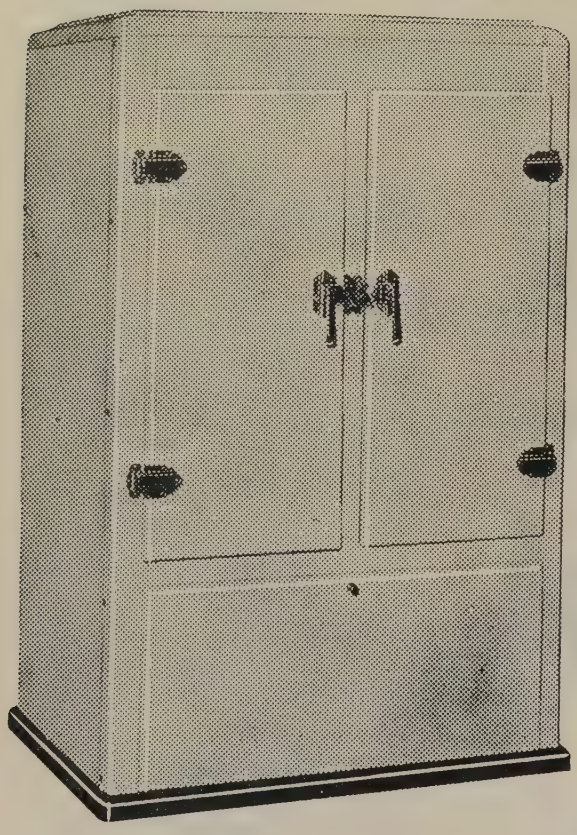
Ingredients.—

Caustic soda	..	1 lb.
Water	..	1½ quarts
Clarified fat	..	6½ lb.

NOTE.—It is much the wisest plan to use a benzine tin for the soap-pot, for caustic soda will soon ruin any tin or iron household saucepan.

Method.—Clarify the fat by melting it and letting it cook slowly with water. Then let it cool, and the clear fat will solidify on top of the water, leaving behind any salt and dirt. Lift off the fat and remelt it, allowing it to cook slowly until it no longer " crackles." This means that any water left in the fat has evaporated,

FRIGIDAIRE



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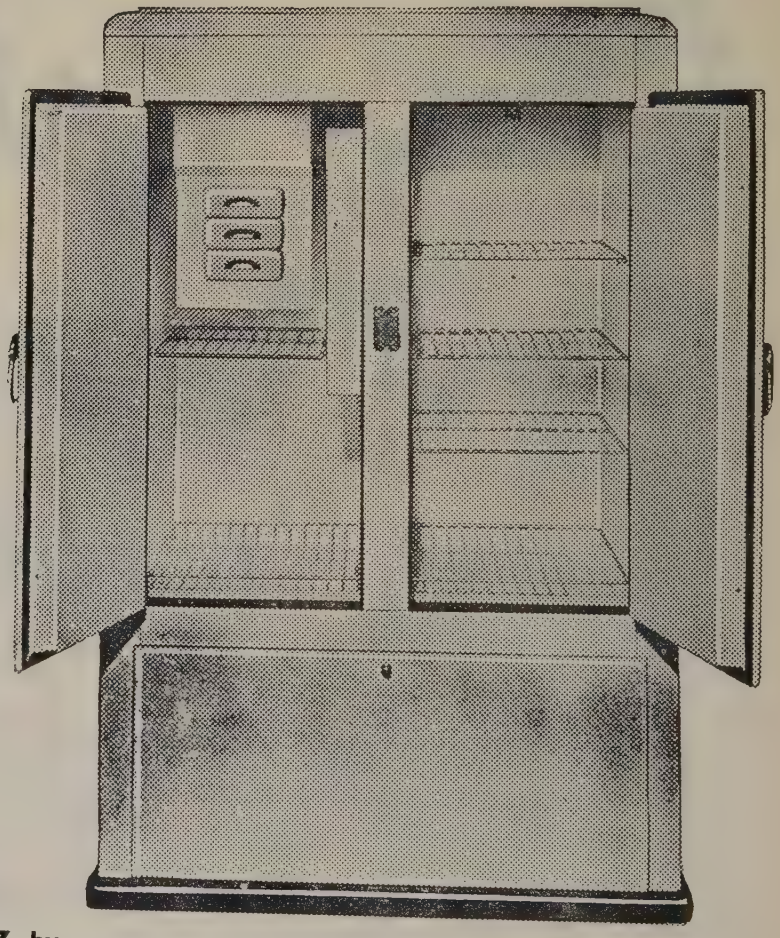

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Starches and Sugars.	Fats.	Protein.	Lime or Calcium.	Iron.	Iodine.	Roughage (Laxative).	Vitamin A.	Vitamin B.	Vitamin C.	Vitamin D.
Bread Scones Macaroni Rice Cereals Tapioca Sago Potatoes Beans and peas Sugar Treacle Syrup Honey Preserves Jellies Dried fruit Sweets Cake Biscuits Desserts	Butter Cream Cheese Lard Bacon Margarine Vegetable oils Peanut butter	Milk Eggs Cheese Lean meat Fish Beans Peas Nuts Cereals (a little)	Milk Buttermilk Cheese Cottage cheese Spinach Cabbage Carrots	Liver Spinach Red meat Beans Yolk of egg Bran Whole potatoes Asparagus Whole cereals Green vegetables—*e.g.*, cabbage, celery, &c. Dates Figs Prunes Rhubarb Apricots Apples Oysters	Salt-water fish Salmon Cod-liver oil Oysters Sardines Irish moss Iodized salt Wholemeal products Leafy vegetables Eggs and milk are also relatively rich	Fruit and vegetables Leaf and stem vegetables Root vegetables Fruit, especially if skin eaten Whole cereals Bran	Cod-liver oil Liver Butter Cream Whole milk Cheese Egg yolk Green peas Green beans Spinach Tomatoes Carrot Sweet potato Oysters Lettuce	Yeast Marmite Whole cereals Spinach Cabbage Tomatoes Carrots Peas Beans Vegetables (if water in which cooked is used) Oranges Lemons Peanuts Lettuce	Oranges Lemons Grapefruit Tomatoes Raw cabbage Lettuce Raw milk Rhubarb Raw carrots Apples Potatoes Celery Green vegetables (if cooked quickly and without soda)	Cod-liver oil Butter Egg yolk Sunlight Oysters

SOME GENERAL RULES FOR MEAL PLANNING.

1. Drink sufficient water—six glasses daily.
2. Fresh uncooked vegetables or fruits twice a day.
3. Two vegetables besides potatoes daily.
4. One and a half pints of milk for each child, a pint for each adult, a day.
5. Use plenty of eggs.
6. Make use of cooking-water of vegetables and fruits in soups gravies, desserts, &c.
7. Use some crisp salad foods daily.
8. Avoid an excess of rich foods—*e.g.*, pork and pastry—at one meal.
9. Provide a variety from day to day.
10. Use home-grown seasonable foods if possible.

A larger copy of this chart on stiff cardboard suitable for hanging in the kitchen for quick reference is obtainable from the Association for Country Education, University of Otago, Dunedin.

carrying with it much of the fatty odour. Then strain the fat through fine muslin to make sure that it is clean.

Dissolve 1 lb. of commercial caustic soda in 1½ quarts of water. The liquid will become quite hot. Cool down until it is just warm. Then take 6½ lb. of the warm liquid fat and pour it slowly into the warm caustic lye, stirring with an agate spoon or a stick until it is the consistency of honey.

Line an enamel pan with greased paper or damp calico and pour the soap mixture into it. Cover and leave in a warm place twenty-four hours, when it will be ready to cut up and be stored away to dry. After about a month it will be ready for use.

This is, of course, the simplest kind of soap, and is used for washing dishes and other household purposes; it is the most common type made in the home. Soft soaps are made directly, using caustic potash instead of caustic soda. Because of the difficulty of procuring pure, natural oils and the impossibility of "milling" the soap to produce a fine, smooth product, it is not practicable to attempt to make toilet soaps at home. There are many good brands on the market, and the prices are not prohibitive.

A more complete article on "Soap and Soap-making" will be published in the *Journal* shortly.

Answers to Inquiries.

Readers are invited to submit inquiries on domestic matters for reply by the Association for Country Education. Inquiries should be addressed to the Editor, *Journal of Agriculture*, Department of Agriculture, Wellington.

Mrs. C. H. G. S. (Address indistinct): Meal-planning chart was posted, but may have gone astray. If this is so, please send your address and another will be posted to you.

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E. V. PAUL, Government Printer, Wellington.—1939.

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90. Daily Variations in Milk-test.
96. Lemon-culture.
100. Apple and Pear Black-spot.
101. Brown-rot of Stone-fruits.
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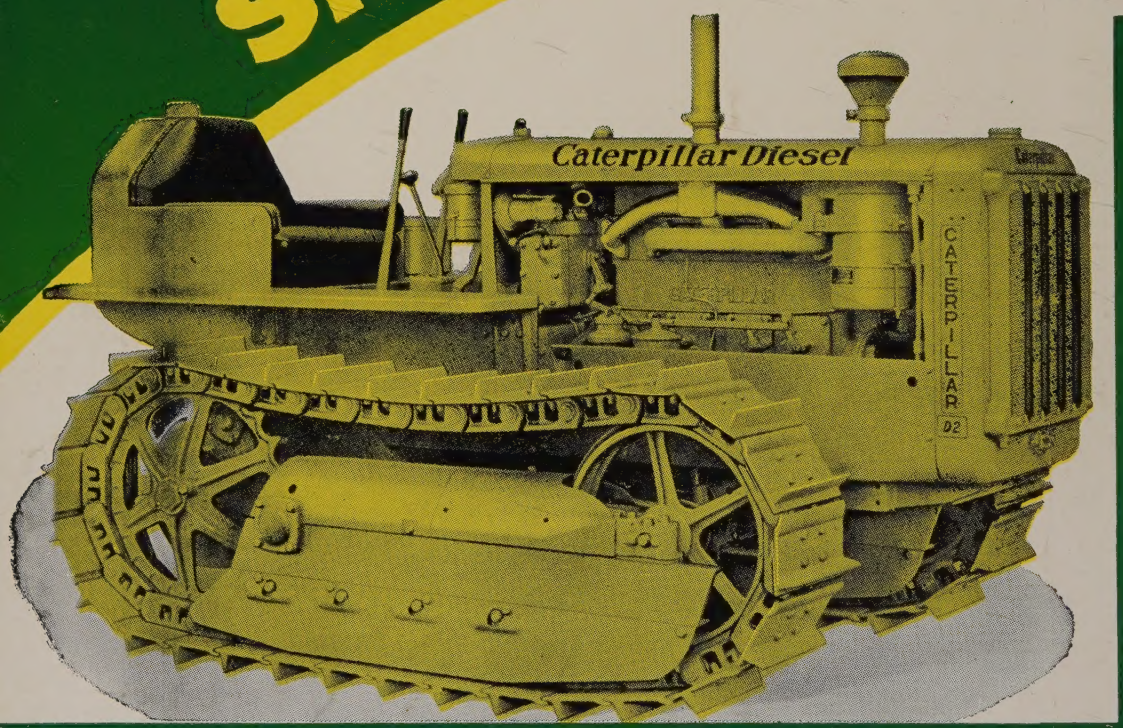

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